

### **TRASANA**



TECHNICAL REPORT NO. 3-78

## FLIGHT PROFILE PERFORMANCE HANDBOOK VOLUME VIIC — CH-47C (CHINOOK)

**APRIL 1979** 



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DEPARTMENT OF THE ARMY US ARMY TRADOC SYSTEMS ANALYSIS ACTIVITY WHITE SANDS MISSILE RANGE NEW MEXICO 88002

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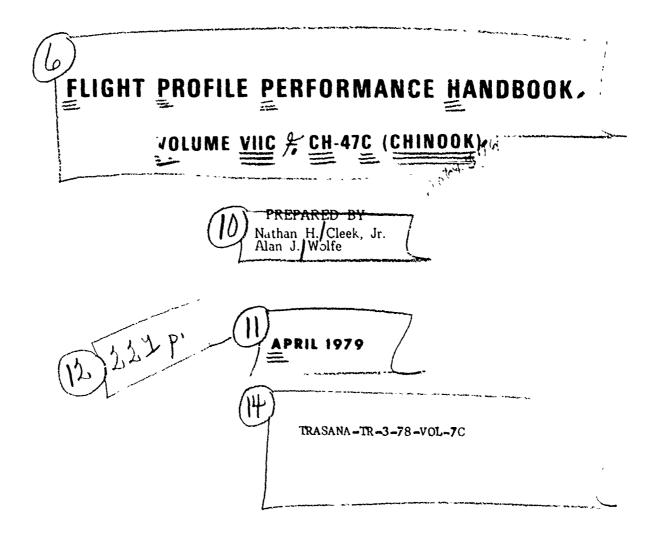
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At TRASANA, Mr. Frank Gonzalez provided help and guidance during the preparation of the Handbook.

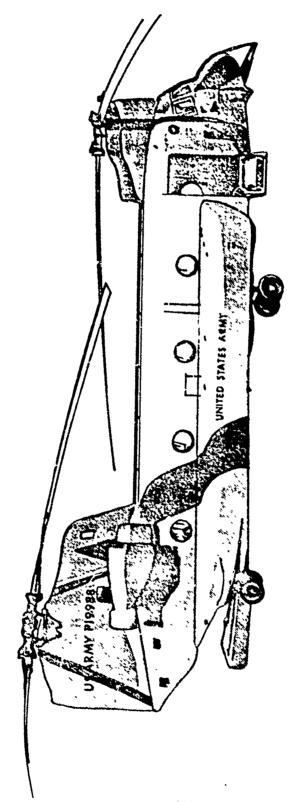
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CH-47 CHINOCK

### CHAPTER 1

### INTRODUCTION

### 1. PURPOSE

The purpose for preparing this handbook series is fourfold: (a) to validate CHINOOK performance data quickly, (b) to reduce the manpower and time to prepare accurate flight profiles, (c) to standardize performance data so that the analysis community can benefit from a single reference in conducting studies and (d) to provide a handbook that can be used for training in the mission profile planning area.

### BACKGROUND

The CHINOOK performance data contained in this Flight Profile Performance Handbook (FPPH) series was originally acquired as a data base for the Aircraft Mission Processing Simulation (AMPS) model. AMPS is a computer program developed by the Aviation Systems Analysis Branch of the US Army TRADOC Systems Analysis Activity (TRASANA) to support Cost and Operational Effectiveness Analyses (COEAs). AMPS generates detailed flight profiles for a wide variety of helicopter missions. The data was provided TRASANA by the Army Aviation Research and Development Command (AVRADCOM) and was the most accurate data available to AVRADCOM at the time of handbook publication. In structuring the data base for AMPS it was noted that the data, when properly organized, could provide a method of doing quick and simple flight profile simulations. This volume presents the CHINOOK data and explains how it can be used.

### 3. OBJECTIVES OF THE HANDBOOK

- a. <u>Data Validation</u>. This volume of the handbook contains tables with the precise performance data and format required to develop flight profiles for computer simulations. Using the handbooks as a reference, the individual project manager (PM) will be able to quickly validate or update as required all associated data contained in the different tables. If this procedure is followed by the various PMs, support of Helicopter COEAs and other analyses can be efficiently implemented.
- b. Flight Profile Development. Much of the manpower and time spent in preparing flight profiles for supporting aircraft COEAs is dedicated to look-up, correlation and validation of performance data. Once the procedure contained in this handbook is implemented, flight profiles can be easily prepared. What normally took one man 4 to 5 days to prepare can now be prepared in 3 to 4 hours.

- c. Standardization of Performance Data. Each of the PMs has been contacted by AVRADCOM to validate the performance data contained in each handbook in this series. Once each handbook is published, the data contained will be kept current as of the publication date. Since the requests for current information are constantly being forwarded to the PMs by analysis groups, this handbook can be a reference and assure a commonality in studies within the community.
- d. <u>Training for Planning Missions and Flight Frofiles</u>. For training purposes each handbook can stand alone. It is only a matter of following the example provided and applying the proper data to fit the flight profile desired. Although the example snown is simplistic, the methodology may be expanded to apply to any flight profile no matter how complex.

### 4. OTHER VOLUMES

This handbook is one of a series that covers the helicopters in the US Army inventory. The complete set of handbooks and their subjects are:

Volume I - FPPH Description

Volume II - UH-60A (BLACKHAWK)

Volume III - AH-1G (COBRA)

Volume IV - AH-1S (COBRA)

Volume V - YAH-64 (Advanced Attack Helicopter [AAH])

Volume VI - OH-58C (KIOWA)

Volume VII - CH-47 (CHINOOK)

Volume VIII - CH-54 (TARHE)

Volume ix - UH-1H (HUEY)

### 5. GENERAL HANDBOOK DESCRIPTION

a. <u>Performance Data</u>. The data contained in these volumes is CHINOOK performance data compiled from the results of actual experiments. It is not engineering data and is not intended to serve as a base for future helicopter construction or acquisition. The more mature the helicopter becomes, the less likely there will be a change in the basic performance data.

- b. Handbook Organization. This volume is one of a series of volumes as identified in paragraph 4 above. Volume I is a description of the methodology used to develop the tables for each of the other volumes. This volume and all other volumes except Volume I provides a simplified flight profile example in Chapter 2. Chapter 3 provides an explanation of each of the five types of data tables contained in the handbook. The five types of tables deal with: (1) Basic Fuel Flow Data, (2) Delta Fuel Flow for Drag Data, (3) Ground Idle Fuel Flow Data, (4) Gross Weight Limits Data and, (5) Velocity Limits data. Chapter 4 contains the actual tables to be used for developing flight profiles.
- c. Volume VII Organization. The US Army has four different versions of the CH-47 CHINOOK. Due to the large amount of data for these four versions and to allow for easier reference, there is a separate section of Volume VII for each. Volume VIIA contains data for the CH-47A. In the same manner, Volume VIIB contains CH-47B data, Volume VIIC contains CH-47C data, and Volume VIID contains CH-47D data.

### 6. CH-47C OPERATION RATES

The CH-47C engine operates at two different rates which are dependent on the aircraft's gross weight. At gross weights of 40,000 lbs or less the engine runs at 235 RPM, above 40,000 lbs the rate is 245 RPM. Consequently, separate tables are provided in this volume for the different RPMs. The tables for 235 RPM are in Chapter 4 of this volume, while Chapter 5 contains the tables for 245 RPM.

### CHAPTER 2

### FLIGHT PROFILE EXAMPLE

### GENERAL

This chapter provides an example of how to develop a flight profile, albeit simple, that can be extended to cover any number of stops, loads and distances all depending on helicopter capability and fuel available.

### 2. DISCUSSION

- a. The main question this example of a flight profile will answer is, "Do I have enough fuel to fly the proposed mission?"
- b. Suppose a pilot is to fly a simple resupply mission in a CH-47C CHINOOK helicopter that calls for flying (as shown in illustration 2-1) from point A (the air base), to point B (the pick up area) to point C (the drop off area) and return to A.

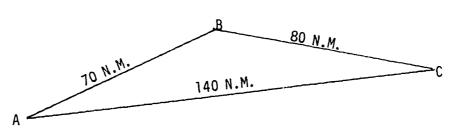
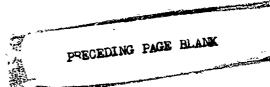


Illustration 2-1

c. The other information given is airspeed (AS) from A to B which is to be 70 knots (kts), from B to C 40 kts, and from C to A 70 kts. The CHINOOK helicopter is to be flown, at 4,000 ft for all legs at an ambient temperature of 15°C, and an idle altitude for take off, pick-up and drop off areas (ground level) of 2000 ft\*. The mission plan also shows 10 minutes idle at A before take off, 20 minutes idle at B while loading, 20 minutes idle at C while unloading and 10 minutes idle on return to A before shut down. The CHINOOK will be flown empty at a gross weight (GW) of 20,000 lbs from A to B and from C to A, while the cargo from B to C will be 16,000 lbs.

<sup>\*</sup>All altitudes are in reference to sea level.



### CHAPTER 2

### FLIGHT PROFILE EXAMPLE

### 1. GENERAL

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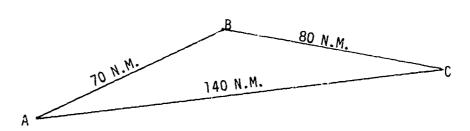


Illustration 2-1

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<sup>\*</sup>All altitudes are in reference to sea level.

d. The flight plan is prepared by drawing up a table similar to Table 2-1 below. By filling in the blanks under fuel, it can be determined if the total is too large for the helicopter.

TABLE 2-1

Helicopter: CHINOOK (CH-47C)

Altitude: 4000 ft flight/2000 ft idle

Temperature: 15°C

LEG	DISTANCE	AS	TIME	GW (lbs)	FUEL
Idle @ A	•	-	10 min	-	
A-B	70 N.M.	70 kts	1 hr	20,000	
Idle @ B	-	-	20 min	_	
B-C	80 N.M.	40 kts	2 hr	36,000	
Idle @ C	-	-	20 min	-	
C-A	140 N.M.	70 kts	2 hr	20,000	
Idle @ A	-	-	10 min	-	

e. First fill in Idle 0 A, Idle 0 B, Idle 0 C and 2nd Idle 0 A since they will all come from Table 2-2. In each case the idle is at 2000 ft and a temperature of  $15^{\circ}$ C. Consulting the ground idle fuel shown in Table 2-2, the value of 1374 lbs/hr is at the intersection of 2000 ft and  $15^{\circ}$ C.

1st Idle  $@A = 1/6 \times 1374 = 229 \text{ lbs}$ 

Idle 0 B = 1/3 X 1374 = 458 lbs

Idle  $@ C = 1/3 \times 1374 = 458 \text{ lbs}$ 

2nd Idle  $@A = 1/6 \times 1374 = 229 \text{ lbs}$ 

148E 2-2

GROUND IDLE FUEL FLOW

AIRCRAFT - CH-47C

CHINOOR

			PRES	PRESSURF ALTITUDE (FT)	TUDE (FT)		
		SEA LEYEL	2000	000#	0009	0003	10000
0 0 0	-25 C	1480	1 400	1280	8811	1104	1040
	) G.	1463	1388	1268	9211	2601	1028
	15 C	1454	1374	1254	2911	1078	. 1014
	35 C	0651	1360	0521	8 1 1	<b>5901</b>	1 200

ENTRIES ARE AIRCRAFT FUEL FLOW RATES IN LBS/HR

TABLE 2-3

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 40CO FT TEMPERATURE: 15 C

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		9	2		 	,	·		_	T	<u>س</u>		0		-
			100	2210		3	7197		2717		3023		3190	, , ,	
		97.	0,	1407 1686 2127		22.3	7177	23.00	4002		2429		9/57	27.44	1111
		120		1686		1777		200	000	203.	2021	2173	9/57 7/12	2135	1
		100		11407		1529 1777 22.3		1662		1807		1960		2151	
, K+0		. 80		1251	ŀ	1461		1071		11749 11804		1015		2096	
FLIGHT MODE , K+C1		9		7001		2441				1181		2006 11915 11969		2213	
FLIG		40	1400		2171	0107	0 . 0 .	1010 11639			1	4077	9.50	6310	
		NOE	1572		1760		1001	0	1000	6702 6777	2400	011	2700	7,	
	1000	no GE	1644		1891		2154		Γ				3075		
	HIGE	351	1527	- 1	1739		1961		2197 12429		2437 2737		2711	210 2213 2096 2151 2735 2744	
GROSS WEIGHTS	(182)	20.00	000103	24.000	0001.3	2000	000107		32,000		36,000		40.000		

an a supplement

Notice the conversion from minutes to hours. These values must be used because fuel flow is in lbs/hr.

- f. The fuel flow for the three legs of the mission are calculated next. The heading on Table 2-1 shows a need for the Basic Fuel Flow data chart for the CHINOOK helicopter flying at 4000 ft and at 15°C ambient temperature. Table 2-3 contains the necessary information.
- (1) leg A-B is at 70 kts and 20,000 lbs. This is not one of the values given but 60 kts is 1362 lb/hr and 80 kts is 1321 lb/hr. Interpolation gives the value of 1342 lb/hr for a 70 kts airspeed. Since the leg is one hour long:

Leg A-B =  $1 \times 1342 = 1342 \text{ lbs}$ 

(2) Leg B-C is at 40 kts and 36,000 lbs. This value is in the table: 2259 lbs/hr. Since the leg is two hours long:

Leg B-C =  $2 \times 2259 = 4518$  lbs

(3) Leg C-A is at 70 kts and 20,000 lbs. This fuel flow rate was computed above to be 1342 lbs/hr. Since the leg is two hours long:

Leg C-A =  $2 \times 1342 = 2684$  lbs.

g. The flight profile can be finished by filling in Table 2-1 as shown in Table 2-4.

### TABLE 2-4

Helicopter: CHINOOK (CH-47C) Altitude: 4000 ft flight/2000 ft Idle

Temperature: 15°C

LEG	DISTANCE	AS	TIME	GW (1bs)	FUEL
Idle @ A	dia		10 min	*	229 lbs
A-B	70 N.M.	70 kts	1 hr	20,000	1342 lbs
Idle @ B	**	-	20 min	-	458 lbs
B-C	80 N.M.	40 kts	2 hr	36,000	4518 1bs
Idle @ C	gannelesges an en regunsige, generaletellinger albeitellinger betrette betreven. Die	•	20 min	-	458 lb:
C-1	140 N.M.	70 kts	2 hr	20,000	2684 1b
lale @ A	agenera, age, un de principio regio, estinguistica despisa de solimpio de Simpre agio a vida. Alla	b-	10 min	-	229 lb
				Total	9918 1b
				ł	1

- h. Although only two look-up tables were used for this example, each type of table has several conditions that are changed so that a wide band of performance parameters can be addressed. The discussion caleach of the five types of tables is contained in Chapter 3. A succinct description of each of these five types of tables is:
- (1) Basic Fuel Flow Date: Gives the rate the aircraft uses fuel dependent on the given flight conditions.

- (2) Delta Fuel Flow for Drag Data: Gives the additional rate of fuel flow to be added to the basic rate for external drag.
- (3) Ground Idle Fuel Flow Data: Gives the rate fuel is used when the aircraft is on the ground with its engine running.
- (4) Gross Weight Limits Data: A check on whether or not the aircraft has enough lift to take off with a given weight.
- (5) Velocity Limits Data: Gives the optimum (long range) speed and maximum rates of speed.

### CHAPTER 3

### PERFORMANCE DATA TABLE DESCRIPTIONS

### 1. GENERAL

This chapter describes each of the five basic type tables used for developing flight profiles. The variables within each type of table are described as well as how the specific data required can be extracted.

### 2. BASIC FUEL FLOW DATA

- a. The basic rate of fuel flow\* is determined by five variables:
- (1) Type of aircraft
- (2) Altitude (Air Pressure)\*\*
- (3) Temperature\*\*\*
- (4) Gross Weight\*\*\*\*
- (5) Flight Mode
- b. In each table (see Table 3-1) within the basic type, the first three variables are held constant for the whole table, i.e., (a) Type of Aircraft, (b) Altitude (Air Pressure) above sea level, and (c) Temperature. These variables are stated at the top of each table.
- c. There are six rows of fixed gross weights for 235 RPM: 20,000 lbs, 24,000 lbs, 28,000 lbs, 32,000 lbs, 36,000 lbs and 40,000 lbs (Table 3-1) There are four rows of fixed gross weights for 245 RPM: 40,000 lbs, 42,000 lbs, 44,000 lbs, and 46,000 lbs (Table 3-2). The ten columns are fixed flight modes.
- (1) The first column is Hover In Ground Effect (HIGE). HIGE is used for hovers at a height of 10 feet or less and a component of forward flight 10 kts or less.
- (2) The second column is Hover Out of Ground Effect (HOGE). This is used for hovers at a height of more than 10 feet.

<sup>\*</sup>The basic fuel flow data represents a clean drag configuration with all doors closed, no wing stores, and no external sling loads.

<sup>\*\*</sup>All altitudes or air pressures are feet above sea level.

<sup>\*\*\*</sup>For simplicity, all temperatures are considered to be the average temperature in which the helicopter is operating (Degrees Centigrade) \*\*\*\*Total vehicle weight in pounds.

- (3) The third column is Nap of the Earth (NOE). This is defined as all flight for variable speeds from 0 to 40 kts and variable altitudes.
- (4) The remaining seven columns are for given airspeeds\* (in kts) as the flight mode.
- d. There are 24 of these basic fuel flow charts. Each chart is for a different combination of Air Pressure (Altitude) and temperature.
- e. The Basic Fuel Flow Data is the main table used in simulating a flight profile. For example, assume a pilot's flight path will require 30 minutes of flight at 80 kts airspeed, 4000 ft. altitude, 15°C and a gross weight of 28000 lbs in a CH-47C helicopter. Using Table 3-1 at a gross weight of 28000 lbs and an airspeed of 80 kts, the helicopter will use 1601 lbs/hr fuel, i.e., for 30 minutes, 801 lbs of fuel will be used.
- f. The gross weight values selected provide the basic range of load carrying capability for the ten flight modes of the CHINOOK helicopter. Within the gross weight band shown, linear interpolation\*\* is quite accurate for estimating the fuel flow rates.
- g. For example, using Table 3-1, if the helicopter's gross weight was 30,000 lbs and if the flight mode was 60 kts, the fuel flow cannot be found directly. But by interpolating between 60 kts, 28,000 lbs 1639 lbs/hr and 32,000 lbs 1811 lbs/hr, the basic fuel flow rate for 30,000 lbs is 1725 lbs/hr. In this example, if the helicopter flies in this mode for 30 minutes, 863 lbs of fuel will be used.
- h. As altitude and/or temperature changes occur, different tables are used to look up the aircraft's basic fuel flow rate for each leg of the flight path. Care must be taken that the proper table is used.
- i. Appendix A contains a set of functions that will give a good approximation of the basic rate of fuel flow.

### 3. DELTA FUEL FLOW FOR DRAG DATA

- a. The delta fuel flow for drag is also determined by five variables:
- (1) Type of Aircraft
- (2) Altitude (Air Pressure)
- (3) Temperature

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- (4) Drag Surface (Equivalent Square Footage)
- (5) Air Speed

<sup>\*</sup>All references to airspeeds are to true airspeeds.

<sup>\*\*</sup>All references to interpolation are linear interpolations. See FPPH, Volume I, Chapter 3 for a discussion on the accuracy of interpolation.

TABLE 3-1

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 4000 FT TEMPERATURE: 15 C
AIRCRAFT - CH-47C 235 RPM

CHINOOK CASER

			071	001	2710		2013	7107	20.1	12711	2000	3023		3170	. 677	3761
			7	2	1127		11529 11777 12212 12013	,	2200	1142 100-	2420	6 167	7636	2170	2744	
			120		1684		1777		1888		2021		2172		2335	
	•		100		1341 (1707 (1684 : 127) 12710		1529		1601 11662		1749 11806 2021 12420 1222		196B	2711 3075 2792 2510 22	2151	
	TLIGHT MODE (KTS)	-	. 8u	6	1761		1461		1601		11749		12006 [1915  1968		2086	
	OCT -I		9	1363	7	007	711	00/1	1037		1181	1 2 3 5	14006	23.2	16613	
i	7 7 1	┝	2	1572 1499		176H 1645		9 1 8 1	•	20.00	1202	2250	15.27	2510	2	
		110 5			+	1764	,	1984		2220	,	249B		2792		
		HOGE		5591		1891		12154		2197 2429		2437 2737		3075		
		HIGE		1251	-	66/1		1961		2197		2437		2711		
GROSS	WE LOT IS	(583)	20.000		24.000		24.000		33,000	2000	27.000	391000	000.07	10,000		

TABLE 3-2

BASIC FUEL FLOM
FUEL FLOM MAILS FUN THE GIVEN CUNDITIONS IN LUSYNH
PRESSURE: 4000 FT TEMPERATURE: 15 C
AIRCHAFT — CH-4/C 245 NPM

CHINDUR

なれている。			į	171	FLIGHT HUDE (KTS)	F (KT)	-				
(527)	MIGE	HISE 11092 NOE 40 60 60 190 190 120	RUE	40	20	09	196	120	1		
									•	3	
10,000	2727	2727 3083 2016 2550 2273 2155 2203 739, 244, 344.	4416	7551	2473	2155	2203	139	7 7 7 7	35.6.	
, ;											
46,000	0/27	2010 3750 29/1 2684 2383 2250 2299 1480 2554 3105	1/67	7684	6363	2250	2238	37	7615	3 4 5	
77.77									200	0.0	
000	×100	3017 3446 3135 2825 2475 2347 2401 7574 304.1	3135	1825	2475	2347	2401	1574	300	3620	
44									200-		
2000	5/15	31/3 3650 3311 2973 2613 2450 2569 ,441	3311	2773	2613	7450	2504	3	7 7 7	1 3	

TABLE 3-3

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG PRESSURE: 4000 FT TEMPERATURE: 15 C Aircraft " CH-47C 235 RPM

			AIA	SPEFD	AIR SPEFD IN KTS	S			
		40	09	6.0	100	120	140	160	
7 60	20	13	3	104	203	359	255	8:7	
	100	26	88	208	410	708	1105	8181	
F 1 4 4 1 5	150	39	131	312		618 1056	1691	2838	
	200	52	175	418	821 1403 2368	1403	2368	3857	

- b. Like the basic fuel flow tables, there are 24 tables for delta fuel flow for drag.
- c. There are four fixed rows of equivalent square feet of drag: 50 equivalent sq ft thru 200 equivalent sq ft.
- d. The seven columns are for airspeeds in kts of: 40 kts, 60 kts, 80 kts, 100 kts, 120 kts, 140 kts, and 160 kts.
- e. When an external load is placed on the helicopter, the amount of fuel consumed per hour increases. The delta  $\bar{\imath}$ uel flow for drag tables indicate how much extra fuel consumption to add to the basic fuel flow rate.
- f. In the example given earlier, a 30 minute flight at 80 kts airspeed, 4000 ft altitude, 15°C and a gross weight of 28,000 lbs was used. Using the basic fuel flow tables, the basic fuel flow rate was 1601 lbs/hr. Assuming for this new example that part of the load is external and inducing a 100 equivalent sq ft external drag, the delta fuel flow for drag (Table 3-3) shows 208 lbs/hr should be added to the basic fuel flow rate. Thus the basic fuel flow rate becomes 1601 + 208 or 1809 lbs per hour and for a half-hour flight, 905 lbs of fuel will be used instead of the 801 lbs figured without an external load.
- g. Appendix B contains a function that will give a good approximation of the delta fuel flow for drag.

### 4. GROUND IDLE FUEL FLOW DATA

- a. The ground idle fuel flow rate is determined by only three variables:
  - (1) Type of Aircraft
  - (2) Altitude (Air Pressure)
  - (3) Temperature
- b. There is only one ground idle fuel flow table (shown as Table 2-2). The table has four rows of temperatures:  $-25^{\circ}\text{C}$ ,  $-5^{\circ}\text{C}$ ,  $15^{\circ}\text{C}$  and  $35^{\circ}\text{C}$ , and six columns of altitudes: Sea Level, 2000 ft, 4000 ft., 6000 ft., 8000 ft., and 10000 ft.
- c. The ground idle fuel flow table is used as discussed in the example flight profile in Chapter 2 (Table 2-2). The CH-47C helicopter idling for 20 minutes at 2000 ft. altitude and 15°C, (across the row labeled 15°C and down the column labeled 2000) find the intersection at 1374. Thus, the CH-47C uses 1374 lbs/hr at these conditions and since it is idling for 20 minutes or 1/3 of an hour, it will use 458 lbs of fuel.

- a. If the helicopter had only been 1000 ft. above sea level, the consumption rate would be found by interpolating between the sea level rate of 1454 lbs/hr and the 2000 ft. rate of 1374 lbs/hr which would be 1414 lbs/hr. In 1/3 of an hour 471 lbs of fuel would be used.
- e. Appendix C contains a function that will give a good approximation of the ground idle fuel flow.

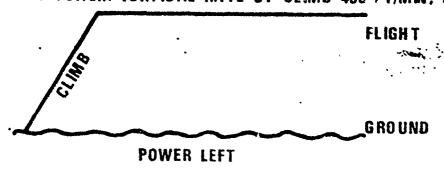
### 5. GROSS WEIGHT LIMITS DATA

- a. Gress weight limits tables are intended to show whether or not the aircraft can safely take off for four sets of criteria. These criteria are defined in the following paragraphs:
- (1) Criteria #1 is based on the helicopter using 100% of Maximum Power for take off and having enough power to lift straight up and above ground effect (See Figure 3-1). Once it is in hovering above ground effect level the helicopter begins forward flight until it acquires, transitional lift and is able to climb at 450 ft/min (a desired standard rate of climb) to the desired altitude. This criteria has some risk since the pilot has no reserve power. It has less risk than Criteria #3 but more than Criteria #2 thus it is considered to be "Middle of the Road" risk.
- (2) Criteria #2 (Figure 3-1) is based on the helicopter using 95% of Maximum Power for take off and enough power to immediately begin to climb at a rate of 450 ft/min. This is the least risky criteria since the pilot has power in reserve and is still able to climb at a satisfactory rate.
- (3) Criteria #3 (Figure 3-1) has the most risk. Using 100% of Maximum Power the helicopter will only hover in ground effect. Therefore, at an altitude of 10 feet or less, the pilot must begin forward flight and gradually increase airspeed to acquire transitional lift to climb. The reasons for its high risk are readily apparent. First, there is no power in reserve. Second, the pilot must begin forward flight at a very low altitude.
- (4) Criteria #4. Structural Gross Weight Limits is the total upper limit of gross weight the helicopter can carry under any take off criteria.
  - b. Gross Weight Limits are determined by four variables:
  - (1) Type of Aircraft
  - (2) Criteria Chesen
  - (3) Altitude (Air Pressure)
  - (4) Temperature

# CRITERIA #1 (MIDDLE OF THE ROAD) 100% MAX POWER, HOGE FLIGHT HOGE NOTHING TO SPARE.

CRITERIA #2 (LEAST RISKY)

95% OF RATED POWER. VERTICAL RATE OF CLIMB 450 FT/MIN, HOGE



CRITERIA #3
(MOST RISKY)

TRANSITIONAL LIFT CLIMB
HIGE
NOTHING TO SPARE.

Figure 3-1

- c. Additionally, Criteria #1, #2, and #3 differ due to engine power limits or transmission power limits of the aircraft. Thus there are six tables:
  - (1) Criteria #1 (Due to engine)
  - (2) Criteria #1 (Due to transmission)
  - (3) Criteria #2 (Due to engine)
  - (4) Criter: \*#2 (Due to transmission)
  - (5) Criteria #3 (Due to engine)

- (6) Criteria #3 (Due to transmission)
- d. The structural gross weight limit is a single value for each helicopter and is only dependent on the type helicopter. The CH-47C structural gross weight limit is given as 46,000 lbs and is listed at the bottom of each table. As the name implies, it is simply not safe to expect the CH-47C structure to maneuver normally when the total weight is larger than that value.
- e. In simulating inflight profile, the gross weight limits tables are used to check whether the aircraft is going to be too heavy to take off under the given conditions. As an example, assume the pilot of a CH-47C planned a mission that called for using take off criteria #1 and the take off was to be at 8000 ft., 15°C, and a gross weight of 38,200. Three checks would be required: First, does this gross weight exceed the structural gross weight limit? Second, does it exceed Criteria #1 (due to transmission)? Third, does it exceed Criteria #1 (due to engine)? In the example given, the answer to all three questions is "No", the take off will not exceed aircraft limits. (Tables 3-4 and 3-5)
- f. If the assigned gross weight had been 42,000 lbs, it would have exceeded the value given for 8,000 ft. and 15°C at Criteria #1 (Due to engine). (Table 3-4) The mission could not be flown as planned. The plan could be changed, for example to take off at 6000 ft. (which might not be practical) or change to take off Criteria #3 (which is more risky but has higher limits).
- g. If the assigned gross weight had been 46,300 lbs., it would have exceeded the structural limits. To perform the mission the only choices would be to lighten the load or get another type helicopter.
- h. Appendix D contains a set of functions that will give a good approximation of the gross weight limits for takeoft.

TABLE 3-4

GRUSS WEIGHT LIMITS

(DUE TO ENGINE)

FUR TAKEUFF CHITERIA #1

100% OF MAXIMUM POWER (HUGE)

AIRCHAFT - CH-47C 245 KPM

CHINOUR

			PRES	PRESSURE ALTITUDE (+1)	UDE (+1)		
		SEA LEVEL	2002	4000	unn9	8000	1000
TEMPFRATURE	~25 C	16669	56757	52912	48952	45261	41716
DEGKEES	J 5-	56570	53172	48993	4542B	42003	366/6
CENTIGRADE	15 C	52434	48807	45302	42050	38750	36072
	35 C	h6h8h	45181	41937	38897	36014	33219

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN L.BS

STRUCTURAL GROSS WEIGHT LINIT: 46,000 LBS

TABLE 3-5

GRUSS WEIGHT LIMITS
(DUE TO TKANSMISSIUM)
FOR TAKEOFF CRITERIA #1
100% OF MAXIMUM POWER (HUGE)
AIRCRAFI - CH-4/C 245 RPM

CHINOUR

	-		200	SURE ALTI	PRESSURE ALTITUDE (FT)		
			13007	4000	0009	0008	10000
		SEA LEVEL	200				7
	- 36	47577	46627	45016	44587	43213	46360
TEMPERATURE	2 2	46546	45567	44545	43484	45341	64114
DECKEES			3, 3, 3	30 70 11	42411	41240	40104
	) S C	45540	44567	67651	7,	7	
CENTICRADE	35 C	64944	43621	42532	41389	40257	37136

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS MEIGHT LIMIT: 46,000 LBS

### 6. VELOCITY LIMITS DATA

- a. There are various types of data given in these tables but like the gross weight limits tables, they are primarily restraints on what can be expected of a helicopter in planning a mission profile. Velocity limits tables are influenced by five variables:
  - (1) Type of aircraft
  - (2) Air pressure (altitude)
  - (3) Temperature
  - (4) Gross weight
  - (5) Condition or limit
- b. Items (1) through (4) are self-explanatory. There are five types of information that can be listed under (5):
  - (1) Long range
  - (2) Maximum continuous power
  - (3) Maximum power (due to engine limits)
  - (4) Transmission limits
  - (5)  $V_{ne}$ (velocity never exceed)
- c. For each aircraft, there are 24 Velocity Limits Tables depending on air pressure and temperature combination. Table 3-6 is an example of the content of the Velocity Limits Table.
- d. The two columns under Long Range (Table 3-6) give the optimum speed and fuel flow for each set of variables #1 through #4 above. Thus the CH-47C operating at 2000 ft., temperature 15°C, and having a gross weight of 28,000 lbs will fly a longer distance if the velocity is kept at 125 kts and will use 2072 lbs/hr of fuel at that velocity.
- e. Maximum continuous power gives the fastest speed at which a helicopter can fly for long periods (30 minutes or more) and the associated fuel flow rate. Ar. example from Table 3-5 would be a CH-47C at 2000 ft. and 15° weighing 28,000 lbs could fly 167 kts with a fuel usage of 3334 lbs/hr.

TABLE 3-6

(INCLUDING FUEL FLOW RATES) VELOCITY LIMITS TABLE

TEMPERATURE: PRESSURE: 2000 FT

AIRCRAFT - CH-47C 235 RPH

Y NEVER	EED	EED	EED F•F• LBS/HR)	xCEED F•F• (LBS/HR)	F.F. LBS/HR)	F.F. LBS/HR)	F.F. LBS/HR) 3211	F.F. LBS/HR) 3211	F.F. LBS/HR) 3211 3319	F•F• LBS/HR) 3211 3319 3438	F•F• LBS/HR) 3211 3319 3438	F•F• LBS/HR) 3211 3319 3438 3542	F•F• LBS/HR) 3211 3319 3438 3542
VELOCITY NEVER	1 1 2	(KTS) (				170		0/1	170	. 20	3	170	-
TRANSHISSION	F . F .	(LBS/HR)				3450	246	0000	3450	3450	+	3450	3.46
TRAN	VEL	(KTS)				177	174		170	167		163	0 0
20 Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	F.F.	(, BS/HR)				3715	3915		3915	3915	30:1	37.15	3915
7 0 2	VEL	(KTS)			0	+ , , ,	187			1 80	74:	*	171
MAX CONTINUOUS POFFR	F • F •	1 L 0 3 / HK /			33.4		3334	3334		3334	3334		3334
CONT	VEL				174		170	167	+	101	160		156
LONG RANGE	F.F.				1718	0.01	2	2072	2217	,677	2506	27.53	6/33
	VEL (KTS)				116	123	*	125	120		133	12:	1001
		GROSS	WEIGHTS (LBS)	30 00	20102	24,939		28,000	32,000		36,000	40.00	

- f. Maximum power (engine and transmission limits) show the maximum speeds the aircraft can structurally attain for short periods of time (less than 30 minutes). Thus the CH-47C helicopter at 2000 ft and 15°C weighing 28,000 lbs has an engine that is capable of producing enough power to fly 183 kts but the transmission limits the aircraft to 170 kts. Between these two columns then, the flight cannot exceed 170 kts with a fuel flow rate of 3450 lbs/hr.
- g. There is another limiting factor called  $V_{pe}$  (velocity never exceed). This velocity limit is determined by helicopter structural considerations.  $V_{ne}$ 's are used in the same manner as maximum power limits described in paragraph f above. Since a value of 170 kts is listed for 2,000 ft., 15°C, and 28,000 lbs, this implies that the aircraft can reach its transmission limit under these conditions.

### DETAILED FLIGHT PROFILE USING ALL PERFORMANCE DATA TABLES

The example of a Flight Profile in Chapter 2 was intentionally simplified to assure clarity. The description of the various tables in this handbook, however, indicates a more complex set of considerations are normally encountered in developing the flight profile. With the description provided in this chapter, additional information should be included in the flight plan beyond that shown in the example and a suggested format is provided below in Table 3-7.

TABLE 3-7

Helicopter: Altitude: Temperature:

DISTANCE	AS	CHECK LIMIT	TIME	GW (LBS)	DRAG	FUEL
			VELOCITY	VELOCITY	VELOCITY	VELOCITY

Needed for each take off: Weight at take off: Type of take off: Check transmission limits: Check engine limits: Check structural gross weight limit:

### CHAPTER 4

### CHINOOK (CH-47C) PERFORMANCE DATA TABLES (235 RPM)

### GENERAL

The following tables are the major information presented in this hand-book. If the procedure for using them is understood, a flight profile for the CHINOOK (CH-47C) helicopter can be prepared in a matter of a few hours. The performance data contained have been reviewed for accuracy and are corrected to the best of our knowledge. The tables are organized in the following manner:

Tables 4-1 to 4-24	Basic Fuel Flow Data
Tables 4-25 to 4-48	Delta Fuel Flow for Drag Data
Table 4-49	Ground Idle Fue! Flow Data
Tables 4-50 to 4-55	Gross Weight Limits Data
Tables 4-56 to 4-79	Velocity Limits Data

BASIC FUEL FLOW DATA

TABLES
(235 RPM)

TABLE 4-1

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: SEA LEVEL TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

	2634 3	89 2634 3 84 2722 3	2634 3 2722 3 285G 3	2634 3 2722 3 285G 3	2634 3 2722 3 285G 3 2977 4 3121 4
	1549 1989	549	549 652 770	<del>                                     </del>	
E (KTS)	1356			_   _   _   _	
SHT MODE	_	1528	1528	1528	1528 1661 1792 1939
FLIGHT		1678	1678	1678	1678 1831 1984 2152
		1749	1749	1749	1749 1942 2141 2349
		1820	1820	1820 2052 2296	1820 2052 2296 2546
		1688	1688 1884	1688	1688 1884 2099 2322
GROSS WFIGHTS		4,000	4,000	24,000 28,000 32,000	24,000 28,000 32,000 36,000
(182)		1688 1820 1749 1678 1528 1491 1652 2084 2722 368	1688 1820 1749 1678 1528 1491 1652 2084 2722 1884 2052 1942 1831 1661 163n 1770 2184 285G	1688         1820         1749         1678         1528         1491         1652         2084         2722           1884         2052         1942         1831         1661         163n         1770         2184         285G           2099         2296         2141         1984         1792         1774         1903         2291         2977	1688     1820     1749     1678     1528     1491     1652     2084     2722       1884     2052     1942     1831     1661     1635     1770     2184     285G       2099     2296     2141     1984     1792     1774     1903     2291     2977       2322     2546     2349     2152     1939     1927     2045     2410     3121

TABLE 4-2

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: SEA LEVEL TEMPERATURE: "S C
AIRCRAFT - CH-47C 235 RPM

	T	T	T	T	T-	T	T
	160	3235	3320	3469	3608	3754	3911
	140	2493	2574	1992	2758	2870	3038
	120	1921	2009	2104	2209	2334	2474
_	100	1536	1641	1762	1894	2035	218a
E (KTS)	80	1185	1520	1659	1801	1945	2090
HT MODE	09	1426	1565	1694	1830	1987	2167
FLIGHT	40	1556	1725	: 872	2027	2217	2429
	NOE	1612	1806	2000	2206	2429	2672
	HOGE	1667	1887	2128	2384	1492	2915
	HIGE	1560	1750	1958	2178	2406	2628
GROSS	(183)	20,000	24.000	28,000	32,000	36,000	40,000

TABLE 4-3

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: SEA LEVEL TEMPERATURE: 15 C
AIRCRAFT - CH-47C 235 RPM

	_		_		_		
	160	3073	3158	3262	3367	3472	3625
	1 40	2402	2480	2566	2663	2778	2918
	120	1887	1970	2063	2174	2304	2450
•	100	1545	1654	1778	1910	2052	220g
E (KTS)	80.	1423	1559	1599	1839	1985	21.45
FLIGHT MODE	09	1470	1604	1735	1881	2049	2239
FLIG	0,5	1608	1767	1913	2085	2292	2517
:	NOE	1666	1800	2058	2275	2515	2776
	390H	1724	1954	2203	2466	2738	3035
	HIGE	1614	1811	2025	2254	2484	2717
GROSS ¥EIGHTS	(587)	20,000	24,000	28,000	32,000	36,000	40,000

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR PRESSURE: SEA LEVEL TEMPERATURE: 35 C BASIC FUEL FLOW

235 RPH AIRCRAFT - CH-47C

CHINDOK

				6	>	١,	า ว	T.	<u> </u>	,	_	Γ,	-	Γ.		Γ.	٠
				1 40		700	6103		2017		317/	2244	75	2347	3310	2 4.00	いっとつ
				140	ı	2339		2415		2503	5005	2604	00	2733	770	2870	1 1 1 2
				120	ı	1873	-	1955	1	2050	1	2165		2300		2452	
		- 5	L	100	L	1565	L	1679		1806		1940		2085	1	23.01 23.01 23.02 2247	
	:	JC (KT		80		1404		1603		1743	T	1984		46.07		22021	
	777	THE HODE (KTS)		00	_	1216	"771			10/1	000	1737	2 0	0117	2311	10163	
	1111		2		1654	- (	1806	- 1	10401		2150		2370	•	2610	7	
			NOF		1718		1913		2118		2349		2605	1	2884		
		1	HOGE		70/1		2020		22/6		2548		2840	_	4814 3158		
		0 0 11	1 1 1 1	1447	, , , ,		7/91	200	407		5757	35.15	0007	20.	7 9 1 4 1		
CROSS	AFIGHTAN TO THE PERSON OF THE	٠,		20,000		24,000		28,000		32.000		36,000		40.000			

TABLE 4-5

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

ROSS				FLIGH	T MODE	FLIGHT MODE (KTS)				
WEIGHTS (LBS)	HIGE HOGE	HOGE	NOE	40	09	90	10ñ	120	140	160
20.000	1462	1568	1514	1459	1338	1308	1475	1882	2479	3350
24,000	1650	1788	1707	1627	1478	1444	1583	1979	2570	3493
28,000	1855	2028	1903	1779	1608	1586	1710	1710 2082	2710 3672	3672
32,000	2077	2276	2106	1935	1746	1732	1847	2195	2847	3884
36,000	2298	2527	2325	2325 2123	1907	1883	1997	2324	3004	4124
40.000	2519	2799	2564	2519 2799 2564 2330 2088	2088	2042 2154		2501	3189	4364

BASIC FUEL FLOW
FŲEL FLOW RATES FOR THE GIVEN CONDIȚIONS IN LBS/HR
PRESSURE: 2000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPM

			140	3	35		30		5		9	Į.	~		7
		ļ		4	3035	7	3130	_	3293		2426	٠	3567	-	70/7
			-		2346	-	6242	1000	0252	-	6707	2750	6/50	20 a E	
			120		1816	100.	0041	2007	, OO 3	2 , 2 3	7717	2257	1677	2406	
	_		100	, ,	701	15.7.	0	1703		1830		1989		2149 1	
	KTS		80	1	1305	1.70	7	11.15	,	1754		1904		2070   2149   2406	
	FLIGHT MODE (KTS)		09	1334	1335	1510		1640		1787	7	1959	†	2151	
	FLIG		<b>1</b>	1510		1667		1814	-	1988	+	2194		2417	
		2014	NOE	1567		1760		6561	1	4/17		0143	25.50	2414 2151	
		3507	HOGE	1625		1853	10.0	1017	٠.	0052	3676		2405 2022	-	
		HIGH	3,1	1516		1711	200	6741	•	F C 7 3	2277	, , ,	2405		
GROSS	WEIGHTS	(683)		20,000	24.000	00017	28.000		32,000		36,000		40.000		

TABLE 4-7

BASIC FUEL FLOW FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR PRESSURE: 2000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

			071		2884	7	2070	- 1		2002	•	3189	-	7 3324	6	3473
				4	2260		2341		24,	16731	_	6538	34.	4007	2823	
			120	1	1783		1869		1970		_	2076	2222	(63:	2387	
***************************************	<b>-</b>		100	Ŧ	1473		1589		1717 1 1970		. 28.5		2005		2173	
	E (KTS		80		1370		1508		6471		179.		1945		2116	
	TELENI MODE (KTS)		09		21.		9501	•	1682	T	1841		2023		2223 2116 2173 2387	
	917	(	20	725	1 2 2	1704	_	0 2 0	000~	7	2051		2/72	ľ	$\neg$	
		2014	NOF	1619		1811		2010	8	33	8477	35.0	4301	2226	1052 8/15	
		HOGH		1682		1919	Ŀ	2177		7776	-	2730	- 1		7	
		T CE		1568		1772		7661		2226		2456		2705 3040		
S S S S S S S S S S S S S S S S S S S	WE IGHTS	15971	200	000.02	300	000117		0000.82		32,000		36,000		40,000		

TABLE 4-8

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 2000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 RPM

GROSS				FLIG	HT MOD	FLIGHT MODE (KTS)	-			
(182)	HIGE	HOGE	NOE	40	09	8.	100	120	140	091
20.000	1620	1738	1666	1593	1453	1415	1493	1769	2201	2782
24,000	1833	1934	1862	1741	1584	1549	1614	1856	2281	2876
28,000	2060	2248	2080	1912	1731	1690	1744	1960	2375	2973
32,000	2292	2530	2325	2120	1961	1835	1884	2087	1642	3071
36,000	2538	2839	2596	2353	2093	1996	2039	2233	2632	3192
40.000	2812	2812 3178	2803	2608	2300	2174	2217	2394	1627	3389

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR TEMPERATURE: -25 BASIC FUEL FLOW PRESSURE: 4000 FT

235 RPM AIRCRAFT - CH-47C CHINOOK

	27	233	245	258	273	290	
	120		1881		2111 273	1955 2273	2499 2811 2545 2320 2075 2:1- 3112 2.152 2.
7.	100	1 407	1523	1545 1656	1694 180D	1955	2 1 5
FLIGHT MODE (KTS)	8'n	1263	1401		7691	185ก	
HT MOD	90	1418 1294	1575 1428	1560	1711	1886	2075
FLIG	40	L		1727 1560	1961	9881 8013	2320
	NOE	1475	1618 1761 1668	2007 1867	2079	2273 2519 231	2565
	390H	1424 1532	1941	2002	9522	2519	2811
	351H	1424	1618	1833	2056	2273	2499
GROSS	(182)	20,000	24,000	28,000	32,000	36,000	40,000

160 3158 3316 3513 4000 4278

3741

40,000

PUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 4000 FT TEMPERATURE: -5 C

AIRCRAFT - CH-47C 235 RPK

	r	_	-	-	-		_	_	_			_			
				160		2850		2989		3129		3274		2440	2770
				- 40	L	2207	ı	2294		2391		2507		2684	- 2
				120		1/18		1812		1918		2046	Ì	2191	1
	1	10		02.	1397		1424 1511	0		8	. 30	1/72		18/3 1949	
	FLIGHT MODE , K-E.		. œ	ľ	128A		1424	1	1560	1	-	5 . / .		18/31	
	GHT MO		09	:	1327	1	1457	ı	1594	1	1755	1	1 9 4 1	1	24091 2:41
	FLI		40	ł		i	3	ı	````	1	104		2178		2409
			MUE	1575		1718		1024		216		2	2042		7675
		HOGE	_[	1588	1	1327		2082	ı	2341		2426	1	2042	27.62
		HIGH		9441		1678		1902		2129		2352		2400	TA.
らなりとり	#FIGHTS	15871	20.00		24.000		28.000		2000			20100		40.000	
	<b>-</b>				7		2		٢	<b>)</b>	Ĺ	?		7	

TABLE 4-11

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 4000 FT TEMPERATURE: 15 C
AIRCRAFT - CM-47C 235 RPM

CHINDOK

GROSS										
WE IGHTS				FL16	HT MOD	FLIGHT MODE (KTS)	_			
(LBS)	1	1000								
	30 7	יייים ביייי	NOE		09	. 8	100	120		!
20,000	1527	1527 11444	1 5 7 2	Т			2	750	2	0 2
				***!	1362	1321	1407	1484	2127	221.0
24,000	1739	1739 11291		1					/ 7	2: 2
				2641 9101 1465	1492	1461	1529	1777	1529 1777 22.2	
28,000	1948	2.54	1						7177	7197
			9841	00 00 00	1639	11407	1662	1 0 0 0	3355	- 1 3 3
32,000	2:0:	96.75					,	000	4062	2917
	/ 1 1 2	217/ 4447 2229		2029	116	1740	1911 1740 180, 202.	263.	0.00	
36,000	2437	2437 2737	2,000	1				1707	6247	3023
		2/3/	2478	5229	2006	1015	2006 1015 1959	2173	25.2	
40,000	2711	3076	220					6116	9/57	3190
		30:2	6/72	100.3 12/92 2510 12213 2094 2151 2005	2213	2094	2151	2226	2.7.1.	
								6553	1117	3421

TABLE 4-12

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 4000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 RPM

000				-						
200kg				FL 16	FLIGHT MODE (KTS)	E KTS				
(182)	2	ᆫ		L						
	3910	HOGE	NOE	40	09	8	100	120	7	1 40
20,000	1579	1700	1616	1616 1533	1394	1.50		•	1	
24.000					~	, 35.	87.1	16/3	2071	2616
	1/18	1954	6181	1685	1531	1499	1554	1766	2167	2713
28,000	2029	2226	205.	1874			<del>-</del> -			
200 6			7		1070	1641	1688	1881	2261	2810
34,000	7266	2522	2311	2100	1873	1971	1834	2020	2301	30.7
36,000	2530	2850	2500	2347	1					67.70
	7			7.07	5/07	1966	2005	2176	2544	3080
40.000	2824	3218	2918	2918 2619	2295	2.4.	2201	2.4. 220, 22.2		

TABLE 4-13

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BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 6000 FT TEMPERATURE: ~25 C
AIRCRAFT ~ CH-47C 235 RPM

	_	Π		Γ	_	T	_	Γ	_	Γ		Γ		T
		L	201	2002	2017	3150	000	233.	1 \ C C C		705	L	3885	
		5 7 7		2100		2331	7	0776	101	1676	1503		6297	
		120	-	1489	- 1	1790	- 1	1005		2017	.00,	2000	6777	
-		100	3	1345		1460		1607		175A		0 : 0 :	0	
E (Kis		. 6		1221		1262	,	1 coa	-	1460	~	102"	, , ,	
FLIGHT MODE (K+S)		09	Ī	1250		1381		1521		1686		1872		
FLIG		5		1375		1528		1686		1879		2090		2222 2220
		NOE		871		1634		1837	Í	2060		2307		25A1
		HOGE	1000	1001	4	)   /		1988		2522		7227		14682 16447
		HIGE	JARO	. 307	1000	7,6.		1813	20.00	5002		6677		16447
GROSS	0.00	15071	20,000		24.000		28.000	000103	10.00		0000.45	20000	000.04	00000

TABLE 4-14

BASIC FUEL FLOW Fuel flow rates for the given conditions in LBS/HR pressure: 6000 ft temperature: "5 c

CH1NOOK

AIRCRAFT - CH-47C 235 RPM

2000				701101	17 MODE	FLIGHT MODE (KTS)	_			
X E 1 G E 1 S	3501	1002	n C N	4.0	90	.08	100	120	140	160
1,5037	1840	7	1484	1484 1411 1279 1544 1337	1279	1244	1337	1627 2078	ļ	2679
000107	1,65	1,52 1805 1681 1558 1409 1385 1462 1726 2169 2833	1681	1558	1409	1185	1462	1726	2169	2833
000.65	1880	1880 2061 1897 1734 1557 1527 1600 1842 2274 2976	1897	1734	1557	1527	1600	1842	2274	2976
20000	2103	2103 2332 2138 1944 1734 168n 1751 1980 2432 3131	2138	1944	1734	1680	1751	1980	2432	3131
36.00	2340	2340 2639 2404 2169 1930 1850 1918 2134 2609 3326	2404	2169	1930	1850	1918	2134	2609	3326
20000	2413 2077 2698 2420 2133 2037 2099 2303 2812 3641	2077	2698	2420	2133	2037	2099	2303	2812	3641

TABLE 4-15

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE; 6000 FT TEMPERATURE; 15 C
AIRCRAFT - CH-47C 235 RPM

GROSS				FLIG	HT HOD	FLIGHT MODE (KTS)	•			
WEIGHTS (LBS)	HIGE	HOGE	NOE	40	09	9.	100	120	140	160
20,000	1461	1612	1528	1443	1310	1310 1576	1348	1596	2003	2549
24,000	1711	1868	1732	1596	1445	1416	1475	1475 1694	2092	2655
28,000	1942	2135	1963	1790	1605	1559	1613	1613 1817	2200	2759
32,000	2174	2174 2428	2221	2014	1791	1717	1717 1767	1961	2336	2903
36,000	2436	2756	2506	2256	1995	1893	1942	2119	2497	3098
40.000	2730	3126	2828	2530	2212	2730 3126 2828 2530 2212 2088 2145 2310 2702 3421	2145	2310	2702	3421

TABLE 4-16

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 6000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 RPM

	3	¥
		C
	(	>
	:	Z
٠	•	-
	3	C
	L	ı
	ì	_

Γ			7		T	_	T	_	Γ	٦	_	7		1
		1.40		2462		12557	3	8592	2000	04/2	7000	3050	3387	
		071		1951		4402	2,16	0017	2205	50.2	7476		2755	
		120		1584		000	1 8 1 3		1942	7	2133		2384   2755	
		100		6061	1490		1630		179A	-	1987	т	ì	
MODE (K+S)		80.		1361	145.		159A	7	1762		1947		4167	
HT HOD		09	1343	2.0	1486		1658		1853		9902		6310 16167 2218	
FLIGHT		9	1475	- 1	1641		1821		2088	1,25	1667	2450	7	
		NOE	1570	•	1785		2031		7307	26.5	510-	2963		
	100	40¢F	9991		1928	I	1122	1000	0797	2879		2850 3276		
	17.7	301u	1542		1768	356	4000	235.	1677	2536		2850		
GROSS	(183)		20100	000	000117	2000.80		32,000		36,000		40,000		

S-a Madisulate

TABLE 4-17

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LAS/HR
PRESS<sup>11</sup>RE; 8000 FT TEMPERATURE; -25 C
AIRCRAF; - CH-47C 235 RPM

CRAFT - CH-47C 235 RPM CHINOOK

	160	2824	3017	3246	3506	3810	
	1 40			2368	2549	1802 1890 2187 2775 3810	
	120	1601	1326 1422 1708 2219	1631	6661	2187	
~	10ú	1290	1422	1475 1566 1831	1863. 1670 1633 1722 1999	1896	2517 2890 2615 2339 2040 1.0. 2072 2.0.
FLIGHT MODE (KTS)	90	1,83	1326	1475	1433	1802	. 0
HT MOD	09	1207	1339	1491	1670	1863	9706
FLIG	40	1661 4041	1482	8591	1863.	2088	2339
	NOE	1404	1602	1814	2051	2316	2615
	HOGE	9241	1721	1794 1970	2239	2543	2890
	HIGE HOGE	1359	1572	1794	2011 2239	2247	2517
GROSS WEIGHTS	(LBS)_	20,000	24,000	28,000	32,000	36,000	40,000

STEEL ST.

**TABLE 4-18** 

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 8600 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 235 RPM

CHINOOK

	T	T	T			T	T	T
	140	+	153	2688	2835	+-	2002	3273
	1 40	9 20 1		2054	2171			2548
	120	1542		1647	1776	1024	2000	2000
	100	-	,	<b>\$1.1</b>	1559	1710	1802	1873 1975 2086 2548
E (KTS	80	1204		1375	1492	1655	1030	529
FLIGHT MODE (KTS)	90	1233	27.5		1531	1720		
FL1G	40	1361	1516		1879 1712 1531	1831	2172	2847
	NOE	1446	1651		1879	2135	2418	
	HOGE	1531	1785		2045	2338	4992	
	HIGE	1409	1631		1857	2084	2346	2638 3047
	[E83]_	20,000	24,000	20.000	000107	32,000	36,000	40,000

· Similaria - I

TABLE 4-19

BASIC FUEL FLOW FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

_	T	7		T							T		1	
		160	2401		12506		2634		2/43	207		2517		
		140	BAR		1984		2105		2257	0000	75.5	7110	09/7	
		120 140	1888 1888	216	1621		1756 2105 2634		1909	1705 0440 50-5	7002	2000	437/	
		100	. 205	16/3	1426		1572		1738		1730		2101 2102 234/ 2/00 3212	
	FLIGHI MODE (KTS)	8.0		1391 1262 1234 1673	1404 1374 1426 1621 1984		1772 1580 1523 1572		1693 1738	ŀ	C861	ŧ		
	MOD T	09	†	12921	7071	20.	1580		1778		1989		2235	
	FL 16	40		1391	025		1772		2006		2268		2569	
		NOF		1488	100	20.	1940	3	2144 2439 2223 2006 1778		2530 2268		2763 3202 2886 2569 2235	
-		HIGE HOGE		1585	7 17 2 .	, r 8 1	2124		2439		2449 2792		3202	
		HIGE	7, 1,	1460		1991	2 10	/ 1 % 7	2164	- 1 - 1	2449		2763	
	GROSS	WEIGHTS -	(503)	20,000		24,000		28,000	000	2010125	24.000	30100	000.00	

BASIC FUEL FLOW FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LRS/HR PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHIVOOK

	ŗ		T				_	T		7	-	7		<del>_,</del>		٠
			L	160	2217	7167	7414	7	2522		2710		2000	200	25.32	3226
			_	140	1502 1840		1942		2074		2231		2443		2841	
				071	1502		1615 1942		1755		1914		2131		2467	
	-		100		1267   1315		6446		8/61		7//4		674		2250	
	FLIGHT MODE , K+51		. 6				1408		1503		h161 h//1 6c41		6461 5.61	2.0.	6117	
	THE MOD		09	130%	1	4.00	1 1 5 0	1634		1840	2	2071		7316	055	
	FLIG		0 4 0	1422		1609		1834		2086		2371		2716	2250 2467 2841	
		1014	NO E	1530	`	1759		2021		27,14 2086		5645		3040		
		HOGE		1638		1740   1908		7022		2543	. 000	1767		2015 3305		
		HIGE		1510		0 4 6 7	-	6161	225	0577	255.11	FCC-	2005	4075		
GROSS	WEIGHTS	(182)	300 000	000102	24.000	00000	28.000		32.000		36,000		40.000			

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 10000 FT TEMPERATURE: -25 C

AIRCRAFT " CH-47C 235 RPM

CHINDOK

							· · · · · ·
	160	2681	2891	3139	34.7	3796	4331
	140	1932	1575 1446 1304 1593 1378 1633 2117 2891	153 <sub>0</sub> 1767 2282	1856 1660 1612 1693 1960 2489	2335 2098 1860 .788 1874 2161 2745	2081 1988 2108 2410 3102 4331
	120	1166 1147 1241 1521	1633	1921	1960	1912	2410
)	105	1541	1378	1530	1693	1874	2108
E (KTS	ůв	441	1293	146	2191	:788	1988
FLIGHT MODE (KTS)	09	1166	1304	1411	1660	1860	
FLIG	40	1371 1286	9441	1800 1640 1471	9581	8607	2686 2374
	NOE		1575	1800	2053	2335	2686
	991H	1456	1704	1773 1960	2250	1852	2554 2998
	391H	1334	1555	1773	1999	2258	2554
GROSS	(182)	20,000	24,000	28,000	32,000	36,000	40,000

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR PRESSURE: 10000 FT TEMPERATURE: "5 C

ACCORAFT - CH-47C 235 RPM

CHINOOK

	160	2"10	2552	2709	2926	3314	3871
	140	1847	1951	2109	2292	2516	2882
	100 120	1455	1580	1719	1876	2059	2373
	100	1 67 1235 1465 1847 2010	1612 1767 1627 1486 1335 1309 1372 1580 1951 2552	1513 1464 1524 1719 2109 2709	2081 2355 2141 1927 1711 1637 1693 1876 2292 2926	1920 1824 1887 2059 2516 3314	2127
FLIGHT MODE (KTS)	90	1167	1309	1464	1637	1824	2040
4T MOD	09	1183	1335	_	1711	1920	2171
FLIG	40	1413 1314 1189	1436	1697	1927	2364 2715 2453 2191	2496
	3011	1413	1627	1869	2141	2453	2828
	HOGE	1385 1511	1757	1835 2041	2355	2715	3160
	HIGE HOGE	1385	1612	1835	2081	2364	2484 3160 2829 2496 2171 2549 2127 2373 12882 3871
0 H 2	(L031)	20,000	24,600	23,000	32,600	36,300	40.000

- Company

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN L9S/HR
PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

**TABLE 4-24** 

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 10000 FT TEMPERATURE: 35 C
AIRCRAFT - CH-47C 235 RPM

	7						
	160	2181	2279	2418	2685	3113	3049 3911
	140 160	1453 1615 1498 1381 1252 1224 1266 1430 1738 2181	1555 1853 2279	6661	2187	2589 2993 2705 2417 2101 1966 2012 2187 2531 3113	3049
	10n 120	1430	5551	1705	1889	2187	2882
		1266	1405	1567	2260 2577 2337 2096 1836 1728 1765 1889	2012	2957 3525 3187 2848 2437 2257 2299 2582
FLIGHT MODE (KTS)	80.	1224	1715 1896 1741 1587 1421 1370 1405	1536	1728	1966	2257
HT MOD	09	7521	1421	1618	1836	2101	2437
FL 1 G	40	1381	1587	1826	2096	2417	2848
	NOE	1498	1741	6102	2337	27.05	3187
	HOGE	1613	1896	5122	1152	2993	3525
	HIGE HOGE	1483	1715	1989 2213 2019 1826 1618 1536 1567 1705 1999 2418	2260	5883	2957
GROSS	(LBS)	20102	247,000	281000	32,000	36,000	40,000

DELTA FUEL FLOW FOR DRAG DATA

TABLES
(235 RPM)

TABLE 4-25

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG PRESSURE: SEA LEVEL TEMPERATURE: -25 C AIRCRAFT - CH-47C 235 RPM

CHINOOK

			AIR	SPEFD	STANI	Ś			
		40	09	80	100	120	140	091	
	5.0	17	58	137	270	59h	730	1286	
ORAG.	100	34	911	274	545	426	1251	2632	
Z •	150	5.1	173	413	813	1384	2426	3978	
SQUARE PERT	200	69	231	553	8401	1866	3328	5324	

でなる。

TABLE 4-26

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG PRESSURE: SEA LEVEL TEMPERATURE: "5 C AIRCRAFT - CH-47C 235 RPM

CHINOOK

			AIR	SPEF	AIR SPEFD IN KTS	S			
		40	09	8.0	100	120	140	160	
	50	16	5.4	129	250	442	089	1068	
DRAG	100	32	108	256	505	870	1372 2326	2326	
Z	150	<b>3.</b>	162	385	762	7299	2157	3583	
SQUARE FEET	200	49	216	515	515 7011	1821	731 3005	4841	

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG PRESSURE: SEA LEVEL TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINDOK

			AIR	SPEFE	AIR SPEED IN KTS	Ŋ		
		40	6.0	80	100	120	140	140
4 8 0	20	15	51	121	235	415	415 640	<u>L</u>
ت د د د	100	30	102 241		472	822	822 1280 3093	3003
	150	45	153 361	361	713	-224	713 7224 1950 3243	1263
THE LEGI	200	9	60 203 482	482	05.2	,63,	952 1624 27311	

TABLE 4-28

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

			A I R	SPEF	AIR SPEFD IN KTS	5			
		0 #	09	90	001	120	140	160	
4	20	1 4	48	<b>511</b>	222	388	119	006	
ت د .	100	28	96	228	hhh	877	1213	8981	
1 L L L L L L L L L L L L L L L L L L L	150	43	551	341	670	1157	1823	2985	
ひをしみなれ ドルガー	200	57	102	454	497	1517 2484	7484	4098	

TABLE 4-29

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

			AIR	SPEF	AIR SPEFD IN KTS	S			
		40	09	80	100	120	140	160	
4 4	50	16	54	127	252	431	679 1207	1207	
و د د د	100	32	167	255	507	857	857 1423 2458	2458	
1 to 0 to	150	8 #	161	385	756	1286	1286 2265 3710	3710	
しましまける アドドー	200	h 9	215	514	64 215 514 5002 1738 3103 4941	1738	1103	1767	

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG

PRESSURE: 2000 FT TEMPERATURE: "S C

AIRCRAFT - CH-47C 235 RPM

CHINOOK

	<b></b>		AIR	AIR SPEED IN KTS	Z Z	T.S	!	
							0 17 -	7.0
		40	09	80	00	120	120 140	
							433	
	20	15	20	617	233		700 014	
				•				
0 × × ∩	100	30	100	238	471	808	1/71 808	5113
•				•			, , 00	2243
2	150	3. R	151	358	708		0107	1206 2010 3372
1 1 1	•							
SQUARE PEE	200	09	201	480	939	1609	1609 2:99	4511
					A			

TABLE 4-31

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG PRESSURE: 2000 FT TEMPERATURE: 15 C AIRCRAFT - CH-47C 235 RPM

CHINDOK

			A I R	AIR SPEED IN KTS	Z = Z	م		
		40	90	80	100	120	1 40	140
288	5.0	<del>+</del> -	47	112	218	386	595	668
• •								
~	100	28	94	224	4 40	764	764 1190	1946
•	(							
SOUTH PERSON	150	42	142	336	699	138	1817	1044
	(					,		
	200	26	189	440	00 00 00		2541 4142	4 4 4 5
		P					-	7:14

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG

TEMPERATURE: 35 C PRESSURE: 2000 FT

AIRCRAFT - CH-47C 235 RPM

CH1NOOK

			A I R	SPEF	AIR SPEED IN NIS	5		
						200	0 7 1	091
			07	— Ю	001	0.7		
		2	3				773	A 2 7
		:	2.5	106	206	361	0	
	ວ	?						.745
₩ 80 C		2.6	60	211	413	723	0711	2
ع ا	001	07					207.	2785
Z		3.	77.1	317	624	1075	6401	2013
•	150	2.4				L	23.6	2820
SOURCE FEET		2	178	423	835		21.67	1428 2313 3251
1	200	, ,						

TABLE 4-33

CORRECTION FUEL FLOW LBS/AR FOR FXTERNAL DRAG PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCHAFT - CH-47C 235 RPM

CHINDOK

			4 I F	SPEF	AIR SPEED IN KTS	75		
		40	09	80	100	120	140	160
DRAC	5.0	15	20	89	235	398	633	1133
2 Z	100	30	100	238	472	795	795 1338	2295
SQUARE FEFT	150	45	150	359	701	1194	2120	3457
	206	09	201	481	0,0	41.8	0,00	11.6.20

TABLE 4-34

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG TEMPERATURE: -5 PRESSURE: 4000 FT

35 RPM AIRCRAFT - CH-47C

CHINDOK

1	_	7		7-		_		_		
		L	0 7 1	0,10	7	1	/502/	31311	2164	4210
		Ĺ	) 	587		1 Ao		1884		5697
	<u>م</u>	120		380		749		6111		1495
O I N		100		217		439		658		871
AIR SPEED IN KT.	.	80		0:	33.	177	22	100	1777	7
ALI	19.	9	6.7	, ,	60		1 40		187	
!	24	2	7 7		28		42	1	5.8	
	_	$\dagger$		+	-	$\mid$		-	_	
			2	00.	2	2	200	200	202	
	į		DRAC	9	Z	:		- ]  -		
			C	1	Proj	•	SQUARE			
	- (									

4210

- Marine - 5-

TABLE 4-35

CORRECTION FUEL FLOW LBS/HR FOR FXTERWAL DRAG PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

			AIR	SPEFC	AIR SPEFD IN KTS	ſſ			
		0 #	09	80	100	120	140	160	
V <b>4</b> a c	50	13	1 1	104	203	359	552	857	
9 C Z	100	26	88	208	410	86.7	7,38 1105	1818	
	150	39	131	312	819	1956 1691	1691	2838	
	200	52	175	418	821	1 403	821 1403 2348	1857	

TABLE 4-36 CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CH I NOOK

			AIR		SPEFD IN KTS	ſs		
		40	0,9	80	100	120	140	160
0 <b>4</b> 40 0	50	21	t 1	86	161	337	524	624
9 : Z : ►	100	42	83	196	384	672	1045	1631
105 108 108	150	3.7	124	294	581	866	1574	2597
3	200	449	165	393	776	1326	2157	3558

TABLE 4-37

enter a second commende and a second commende and second commended and second commended and second commended a

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG PRESSURE: 6000 FT TEMPERATURE: -25 C AIRCRAFT - CH-47C 235 RPM

			AIR	R SPEF	SPEFD IN KTS	TS		
		40	09	80	100	120	140	160
DRAG	50	h [	94	110	220	368	589	1063
Z	100	5.8	63	222	437	736	1255	2141
SQUARE FEET	150	Z h	140	335	649	1108	1979	3219
	200	56	188	448	862	1506	2702	4298

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG TEMPERATURE: "S C

PRESSURE: 6000 FT

AIRCRAFT - CH-47C 235 RPM

	<b>L</b>		0	2 4 4 4	STX NI CLUGO G.	v		
			£ <b>-</b> €	1				
				0	0	120	120 140	200
		4	09	0	20.			
							7 7 7	893
			103	103	203 351	125		
	0.50	~	,					200
0	1		2.7	204	404	693	204   409   693   1106   1707	70/2
	001	97	8					
			•	- 1	410	1037	311 610 1037 11/60 2716	27.16
2	150	39	39 1130	-				0
			717	417	808	1387	ANB 11387   2431   3717	3717
とうしょ しょうしゅい	200	52	174					
	> 7 -							

TABLE 4-39

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

			AIR	R SPEF	SPEFD IN KTS	(Ts		
		40	09	80	100	120	140	160
DRAC	20	12	1 +	96	681	333	115	780
, Z	100	5 4	8.1	193	382	959	1025	1697
SOUARE	051	36	122	162	574	616	1574	2644
	200	6 16	163	389	197	1301	2206	3590

TABLE 4-40

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG PRESSURE: 6000 FT TEMPERATURE: 35 C AIRCRAFT - CH-47C 235 RPM

			-					
			AIF	SPEF	AIR SPEED IN KIS	75		
		40	09	80	100	120	140	160
~ A a C	2.0	11	38	16	178	314	485	723
5 2 2 2	100	23	77	182	358	622	968	1523
	051	<del>4</del> €	115	273	541	928	1461	2419
	200	9 %	153	366	720	1230	2009	3311

TABLE 4-41

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG PRESSURE: 8000 FT TEMPERATURE: "25 C AIRCRAFT " CH-47C 235 RPM

CHINGOK

			AIR	R SPE	SPEED IN KTS	10			_
		6 17				,			
		ם כ	09	90	001	120	- 2		
	C							200	
DRAG		۲,	43	103	204	340	548	000	
)	100					2		775	
Z	200	92	87	208	404	681	Ĺ		
							00:	111	
SQUARE FEET		3,4	131	312	900	1028	9481	000	
	200	1					1	2773	
	202	25	175	4 2 3	200				
					0		7	-	

TABLE 4-42

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG PRESSURE: 8000 FT TEMPERATURE: -S C

AIRCRAFT - CH-47C 235 RPM CHINOOK

			AI	R SPER	AIR SPEFD IN KTS	Ts		
		40	09	80	100	120	1 40	160
	50	12	0 17	96	061	323	505	844
ช ช :	100	24	8 1	761	380	641	1029	1779
Ζ → ι	150	37	121	290	564	656	1645	2713
SECARE FEE	200	64	162	388	748	1286	2264	3646

TABLE 4-43

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG

PRESSURE: 8000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPM

CHINDOK

			1 ¥	R SPEF	AIR SPEFD IN KTS	15		
		40	09	80	100	120	1 40	37.
	0.1							
DRAG	20	-	38	89	175	308	474	727
)								/ 7 /
2	001	23	76	180	356	è06	95.1	200.
	0 0 1							
SQUARE PEFT	00.	34	7	271	532	908	1447	2 4 4 4
	0.00						1	1017
	007	46	152	363	708	705 . 20E	2000	
				•	֓֡֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜			

TABLE 4-44

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG Pressure: 8000 ft temperature: 35 c

AIRCRAFT - CH-47C 235 RPM

			AIR	SPEF	SPEFO IN KTS	15			_
		40	09	80	100	120	1 40	0,1	
				,		2	0.	001	
084.	20	î <b>7</b>	35	÷ 60	165	292	448	671	_
9	0 1 .								
2	100	21	7.1	691	334	576	968	1422	
	0 2 3								
Sall and Here	130	32	107	254	502	857	1356	2252	
	200								
	202	43	- 43	341	667	1139	1872	2070	
						֡			

TABLE 4-45

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG PRESSURE: 10000 FT TEMPERATURE: -25 C AIRCRAFT - CH-47C 235 RPM

CH I NOOK

			¥	R SPE	AIR SPEED IN KTS	15			~
		7							
		0	9	O <sub>R</sub>	100	120	140	160	
	0							•	_
DRAG	200	12	7	26	189	315	115	927	_
•	000								_
Z	201	57	82	761	371	630	1112	1952	
	0 2 1						ĺ	7101	
SQUARE FEFT	150	36	122	289	554	954	1726	2777	
	20.0	:					>		
	200	30	163	383	736	300	7776	2700	
							0 - 0	70/5	

TABLE 4-46

many advisorable season of the season of the

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG

PRESSURE: 10000 FT TEMPERATURE: -5 C

AIRCRAFT " CH-47C 235 RPM .

CHINOOK

war with the said of the said of the said

TABLE 4-47

CORRECTION FUEL FLOW LBS/HR FOR FXTERNAL DRAG PRESSURE: 10000 FT TEMPERATURE: 15 C AIRCRAFT - CH-47C 235 RPM

			AIR	R SPEFD	D IN KTS	Ts		
		40	09	80	100	120	140	160
0 4 0	50		35	83	165	283	439	677
9 1 Z 1	100	2.1	7.1	168	330	559	882	1478
F 1 4 4 1 0 6	150	32	106	253	492	836	1368	2289
	200	43	142	338	651	1134	1914	3101

TABLE 4-48

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG PRESSURE: 10000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

			AIR	R SPEF	SPEFD IN KTS	ŤS		
		40	09	80	1 00	120	140	160
DRAC	១ទ	10	33	78	154		414	
9 : Z	100	20	99	157	311	531	828	1329
SOUTH THE TERM	150	30	100	237	465	792	1258	2006
	200	40	133	317	414	- 050	1747	j

GROUND IDLE FUEL FLOW DATA

TABLE

GROUND IDLE FUEL FLOW AIRCRAFT - CH-47c CHINOOK

			PRES	SURF ALTI	PRESSURF ALTITUDE (FT)		
		SEA LEVEL	2000	000h	0009	0008	10000
1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-25 C	081	1 400	1280	1188	1,04	1040
	ນ <b>ຣ-</b>	1468	1388	1268	1176	2601	1028
1	15 €	1454	1374		1162	1078	1014
	35 C	1440	1360	1240	1148	h901	1000

ENTRIES ARE AIRCRAFT FUEL FIOW RATES IN LBS/HR

GROSS WEIGHT LIMITS DATA

TABLES
(235 RPM)

GROSS WEIGHT LIMITS

(DUE TO ENGINE)

FOR TAKEOFF CRITERIA #1

100% OF MAXIMUM POWER (HOGE)

AIRCRAFT - CH-47C 235 RPM

CHINOOK

			PRES	SIIRF ALT	PRESSIIRF ALTITUDE (FT)		
		SEA LEVEL	2000	4000	6000	8000	1 0000
	-25 C	60343	16204	52244	48370	44756	41399
PERAT	) S	56111	52268	48523	96644	41631	38416
DEGREES	18 C	51925	48312	44864	41579	38454	35575
CENTIGRADE	35 C	48055	44752	41564	38535	35661	32939

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

PRECEDING PAGE BLAN

GROSS WEIGHT LIMITS

(DUE TO TRANSMISSION)

FOR TAKEOFF CRITERIA #1

1008 OF MAXIMUM POWER (HOGE)

AIRCRAFT - CH-47C 235 RPM

CHINOOK

	<del></del>		9986	SSURE ALT.	PRESSURE ALTITUDE (FT)		
	•	SFA LEVEL	2000	4000	9009	8000	1 0000
	- 2 E C	47872	46822	45746	44601	43375	42153
TEMPERATURE	2 6 7 1		0 7 0	675 7	02554	42179	41006
יי ני נ	2 5	46753	9000	70011			35.000
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	15 C	45701	44593	43422	42250	41076	3,013
CENT I GRADE	38 C	44683	43531	42371	41234	40040	38789

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

GROSS WEIGHT LIMITS

(DUE TO ENGINE)

FOR TAKEOFF CRITERIA #2

0 G E 952 OF RATED POWER. VERTICAL RATE OF CLIMB 450 FT/MIN.

AIRCRAFT - CH-47C 235 RPM

CHINOOK

			6 3 8 6	SSURF ALTI	PRESSURE ALTITUDE (FT)		
		SEA LEVEL	2000	4000	9009	8000	1 0000
						•	18471
	-25 C	56370	52507	48808	4518/	41000	1,000
0 1 1						( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	1007
コンクーマン・ココー	J 3	57395	48809	45310	42017	38720	10055
1000	,						2000
טרפאנהט	7	48470	45098	41879	38812	35872	3350
U C 4 0 0 1 1 1 2 1	•						04.70
104 KP - E 1 J	35 C	44838	41759	38785	35957	332/3	30730

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS MEIGHT LIMIT: 46.000 LBS

GROSS WEIGHT LIMITS

(DUE TO TRANSMISSION)

FOR TAKEOFF CRITERIA #2

OGE TRANSMISSION POWER LIMIT. VERTICAL RATE OF CLIMB 450 FT/MIN.

AIRCRAFT - CH-47C 235 RPM

CHINOOK

			PAR	SSURF ALT	PRESSURF ALTITUDE (FT)		
		SEA LEVEL	2000	4000	0009	8000	1 0000
TEMPERATURE	-25 C	45804	44872	43912	42917	41844	40704
DEG7EFS	ე <b>გ</b> ₌	44812	43862	42879	41828	40722	39632
2 5 7 F N	15 C	43874	42905	4 873	40787	39713	38633
	3 <b>8</b> C	42982	41970	46901	39838	38779	37644

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL CROSS WEIGHT LIMIT: 46,000 LBS

GROSS WEIGHT LIMITS

(DUE TO ENGINE)

FOR TAKEOFF CRITERIA #3

100% OF MAXIMUM POWER (HIGE)

AIRCRAFT - CH-47C 215 RPM

	<b></b>		0	SRr ALTI	DDESCHAL ALTITUDE (FT)		
		SEA LEVEL	2000	0007	9009	8000	1 0000
							0007
	-25 C	67707	63064	5 g 6 2 1	54273	20217	40447
	1		-				
- FEEFEXA-OXF	111	62917	58608	54408	50454	46736	430/4
1							•
DEGREES	18	58211	54159	59295	46612	43108	37880
			-			1	
	35 C	53868	59105	46,593	43197	39975	30723
	)						

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46.000 LBS

TABLE 4-55

GROSS WEIGHT LIMITS
(DUE TO TRANSMISSION)
FOR TAKEOFF CRITERIA #3
1008 OF MAXIMUM POWER (HIGE)
AIRCRAFT - CH-47C 235 RPH
CHINOOK

0 # # = 1
10000 47304 45984 44703
1 1-1-1-1
8000 48644 47297 46074
E (FT) 6000 9983 8618 7366
6000 49983 48618 47366 46226
PRESSURF ALTITUDE (FT) 300 4000 6000 176 51255 49983 94 49937 48618 71 48671 47366 90 47500 46226
5511RF AL 4000 51255 49937 48671 47500
2000 2000 52476 51194 49971
5EA LEVEL 53683 52399 51210 50071
55 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
-25 C -5 C 15 C 35 C
<u> </u>
TEMPERATURE DEGREES CENTIGLADE
TEMP OE CEN

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LIMIT: 46,000 LBS

VELOCITY LIMITS DATA

TABLES
(235 RPM)

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

TEMPERATURE: -25 C PRESSURE: SEA LEVEL

235 RPM AIRCRAFT - CH-47C CHINOOK

	VELOCITY NEVER Exceed	(LBS/HR)		4090	4248	0444	4734	5004	3805
	VELOC	VEL (KTS)		170	170	170	170	170	150
	TRANSMISSION LIMITS	(LBS/HR)		3376	3376	3376	3376	3376	3376
	TRAN	(KTS)		951	121	151	6 1 1	146	142
	MAX Power (engine)	(1,85/HR)		4732	4732	4732	4732	4732	4732
	E P E	(EL)		181	178	174	170	166	163
	MAX CONTINUOUS POWER	F.F.		4526	4526	4526	4526	4526	4526
	NO D	VEL (KTS)		177	174	171	167	163	160
	LONG RANGE	(LBS/HR)		1634	1794	2027	2189	2433	2620
	34	VEL (KTS)		104	138	113	116	121	122
•			GROSS WEIGHTS (LBS)	20,000	24,000	28,000	32,000	36,000	40,000

泛編

PRESSURE: SEA LEVEL TEMPERATURE: (INCLUDING FUEL FLOW RATES) VELOCITY LIMITS TABLE

235 RPM AIRCRAFT - CH-47C

CHINOOK

	_	).	 		٠,		T-	7			7	_	Ī
VELOCTTY NEVER Sycerd	1	(LBS/HR)			3028	3717		3731	4118	7 20 7	1621	3432	
VELOCY	7	VEL (KTS)			170	170		170	170	0.7	2/1	150	
TRANSMISSION Limits		F.F.			3442	3442		3442	3442		3442	3440	4
TRANS		VEL (KTS)			165	143		159	157		154	<u> </u>	2001
<b>▼</b>	A N.E.	F.F.			4452	444.2	3011	4452	4452		4452	4 4 4 5 3	727
P O S A S A S A S A S A S A S A S A S A S	2 4 1	VEL (KTS)			189	7.9.7	101	1,80	7.76		174		0 /
MAX	<b>EE</b> 7	VEL F.F.			4035	2007	30.5	4035	4035		4035	7.60	4035
CONTI	2	VEL			180		1/8	172	1.8	201	991		791
L ONG RANGE		F.F.			1711		7691	2056	2278	0/77	2468		2012
78		VEL (KTS)			1.10		7 -	A 1 1		123	126		130
brazzania		<b></b>	GROSS	(587)	27.000		24,000	28.000		32,000	36,000		40,000

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES)

PRESSURE: SEA LEVEL TEMPERATURE: 15.C

AIRCRAFT - CH-47C 235 RPM

<u>_</u>	γ		<del></del>			1	1		
	VELOCITY NEVER Exceed	VEL F.F. (KTS) (LBS/HR)		3424	3517	3636	3749	3849	3231
	VELOCT	VEL (KTS)		170	170	170	170	170	150
	TRANSHISSION LIMITS	F.F.		3507	3507	3507	3507	3507	3507
	TRAN	VEL (KTS)	•	172	170	167	163	191	157
	MAX POWER (ENGINE)	F.F.		4200	4200	4200	4200	4200	4200
		VEL (KTS)		192	189	185	181	179	174
	MAX Continuous Power	F.F.		3574	3574	3574	3574	3574	3574
	CON	VEL (KTS)		174	172	168	165	162	159
	LONG RANGE	F.F. (LBS/HR)		1793	1974	2157	2306	2537	2777
	عاهد	VEL (KTS)		115	120	124	126	131	135
1	<b>-</b>		GROSS WEIGHTS (LBS)	20.000	24,000	28,000	32,000	36,000	40.000

TABLE 4-59

PRESSURE: SEA LEVEL TEMPERATURE: 35 C 235 RPM (INCLUDING FUEL FLOW RATES) VELOCITY LIMITS TABLE AIRCRAFT - CH-47C CHINOOK

1	1		$\neg$	T	- <sub>T</sub>	$\top$	T	
VELOCTIT NEVER Exceed	F.F. (LBS/HR)		3284	3383	3495	3589	3675	3016
VELOC.	VEL (KTS)		170	170	170	170	170	145
TRANSHISSION LIMITS	(L85/HR)		3570	3570	3570	3570	3570	3570
TRANS	VEL (KTS)		6/21	176	172	169	: 67	162
A X X X X X X X X X X X X X X X X X X X	F.F.		3989	3989	3989	3989	3989	3989
POSE POSE RESIDED	VEL (KTS)		192	188	184	182	179	:76
CONTINCOUS POWFR	F.F. (LBS/HR)		3137	3137	3137	:137	3137	3137
CONTI	VEL (KTS)		165	162	160	157	154	071
RONGE	F.F.		1874	2060	2202	2400	2624	2845
700	VEL (KTS)		120	128	120	132	136	200
<b></b>		GROSS WEIGHTS	20.000	24.000	28.000	32.000	36.000	

TABLE 4-60

VELOCITY LIMITS TABLE (INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: -25 C

AIRCRAFT - CH-47C 235 RPM

ĺ					<u> </u>				
FONG	NOO	2~O D-1	MAX CONTINUOUS POWER	(END	MAX POWER (ENGINE)	TRAN	TRANSHISSION LIMITS	VELOC	VELOCTTY NEVER Exceed
(LBS/HR) (KTS)	1		F.F.	VEL (KTS)	F.F.	VEL (KTS)	F.F. (LBS/HR)	VEL (KTS)	F.F. (LBS/HR)
1566 177	177	1	4265	1 80	4420	160	3329	170	3852
1777 174	174		4265	176	4420	156	3329	170	4035
1957 170	170	<b>f</b> 1	4265	172	4420	154	3329	170	4287
2175 166			4265	Ĩ 68	4420	151	3329	170	4554
2393 162		•	4265	164	4420	147	3329	170	4822
2547 158	158		4265	191	4420	144	3329	150	3691

VELOCITY LIMITS TABLE (INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: +5 C

AIRCRAFT - CH-47C 235 RPM

- 1					7		_	7		T-	_	
VELOCITY NEVER Exceed		(LBS/HR)				3400	3506		3746	3894	2708	
VEL OC		ΑΑΓ ΑΤΟ Σ				170	170		1/0	170	170	
TRANSHISSION LIMITS	i,	(LBS/HR)			3.5	3340	3390	3300	0,00	3390	3390	1000
TRAN	7 5 7	(KTS)			130	0/1	167	162		159	156	163
T D T S D T	F 0 F 2	(LBS/HR)			4150		4159	4159	20.7	1137	4159	4150
9.X	VEL				189		1 80	178	175		172	168
1AX INUOUS WER	F 0 F 0	(LBS/HR)			3775	3775	6//6	3775	3775		3//5	3775
MAX CONTINUOU POWER	VEL	10 lu			180	177		1/1	167	77.		091
LONG RANGE	( BS/HR)			1,453	7501	1819	2002	270-	2227	2436	1376	1607
	(KEL			113	7	115	121		125	128	+: -:	
		GROSS	WEIGHTS (LBS)	20,000		000047	28,000	32.000	0000	36,000	40.000	1

TABLE 4-62

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 2000 FT TEMPERAT\_RE: 15 C
AIRCRAFT - CH-47C 235 RPM

×
0
0
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U

		<u> </u>						<u> </u>		
		LONG RANGE	CONT	MAX CONTINUOUS POWER	(ENC	MAX POWER (ENGINE)	TRAN	TRANSHISSION LIMITS	VELOC	VELOCȚTY NEVER Exceed
	VEL (KTS)	(LBS/HR)	VEL (KTS)	~	VEL (*75)	F.F.	VEL (KTS)	F.F.	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
20,000	116	1718	174	3334	191	3915	177	3450	170	3211
24,000	122	1910	170	3334	187	3915	174	3450	170	3319
28,000	125	2072	167	3324	183	3915	170	3450	170	3438
32,000	129	2267	164	3334	180	3915	167	3450	170	3542
36,000	133	2506	160	3334	176	3915	163	3450	170	3701
40,000	136	2733	156	3334	171	3915	159	3450	145	2951

TABLE 4-63

VELOCITY LIMITS TABLE (INCLUDING FUEL FLOW RATES)

PRESSURE: 2000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

	<del></del>		7		<b>—</b> r			7
VELOCȚTY NEVER Exceed	VEL F.F. (KTS) (LBS/HR)		3084	3193	3297	3385	3426	2787
VELOCT	VEL (KTS)		170	170	170	170	168	140
TRANSMISSION Limits	F•F• (LBS/HR)		3510	3510	3510	3510	3510	3510
TRANS	VEL (KTS)		184	180	177	174	171	163
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	F.F.		3722	3722	37.22	3722	3722	3722
F P P P P P P P P P P P P P P P P P P P	(KTS)		161.	187	183	181	178	170
MAX MAX MINUOUS POXER	3		2938	2938	2938	2938	2938	2938
CONT #	VEL (KTS)		165	162	159	156	152	146
ON GE	(LBS/HR)		1804	8961	2149	2353	2573	2808
_1 cc	VEL (KTS)		123	126	130	134	139	141
Nanthaman		GROSS WEIGHTS (LBS)	20,000	24,000	28,000	32,000	36,000	40,000

**TABLE 4-64** 

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 4000 FT TEMPERATURE: -25 C
AIRCRAFT - FM-47C 235 RPM

CHINDOK

VELOCITY NEVER Exceed	F.F. (LBS/HR)		3635	3849	4113	4382	4651	3611	
VELOCT	VEL (KTS)		170	170	170	170	170	150	
TRANSMISSION Limits	VEL F.F. (KTS) (LBS/HR)		3290	3290	3290	3290	3290	3290	
TRANS	VEL (KTS)		163	651	156	152	149	144	
AX. Wer Ine)	(j.BS/HR)		8114	4118	4118	4118	4118	4118	
MAX. Power (engine)	(KTS) (		621	175	170	99!	162	158	
MAX ONTINUOUS POWER	VEL F.F.		4003	4003	4003	4003	4003	4003	
O d I I NO D			177	173	168	164	160	156	
LONG RANGE	(LBS/HR)		1513	1744	1909	2148	2317	2481	
→æ	VEL (KTS)		106	113	116	121	122	121	The second secon
**************************************	Trustania ren	GROSS WEIGHTS (LBS)	20,000	24,000	28,000	32,000	36,000	40,000	A STATE OF THE PERSON NAMED OF THE PERSON NAME

**TABLE 4-65** 

VELOCITY LIMITS TABLE
(INCLUDING FUFL FLOW RATES)
PRESSURE: 4000 FT TEMPERATURE: -5 C
AIRCRAFT - ÉM-47C 235 RPM

					-					
		LONG Range	CONT	HAX NTINUOUS Power	- a z	FE SE	TRAN	TRANSHISSION LIMITS	VELOC	VELOCITY NEVER
	VEL (KTS)	VEL F.F.	VEL (KTS)	5) (, BS/HR)	VEL	VEL F.F.	VEL	VEL FF	VEL	VEL F.F.
GROSS						, L	16171	LES/HK)	(KTS)	(LBS/HR)
#E16HTS (LBS)										
20.000										•
00010-	7 7	1610	179	3519	188	3868	174	3776		
24,000	117	1777						5,55	2/7	3170
	•		5/1	3519	181	3868	691	3345	170	7021
28,000	123	8841	691	3519	176	3.868	771	23.00		0000
32,000	124	2179	77.	0.36				3373	2/1	3573
26.000			001	9156	173	3868	162	3345	170	3712
000600	131	2407	162	3519	169	3656	- R R	3746	. 70	
40,000	127	2511	62.			***************************************		6.00	2)	3673
T			, 61	727	164	3868	23	7145	70.	

TABLE 4-66

VELOCITY LIMITS TABLE (INCLUDING FUEL FLOW RATES) PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPH

										•	
The second second		L ON G	TENOD	MAX CONTINUOUS	4	Z O :	TRAN	TRANSHISSION LIMITS	VELOCÍ	VELOCITY NEVER Exceed	
	•		4	FER	(ENC	11821					
	VEL	F + F +	VEL	F • F •	VEL ( r. TS )	F.F.	VEL (KTS)	(LBS/HR)	VEL (KTS)	(LBS/HR)	
	IKISI	1103/001									
GROSS MF16x7c											
(182)									061	3016	
		1642	173	3107	1,90	3642	182	3400			
20,000	117					6 77 7	178	3400	170	3135	
24,000	124	1857	169	3107	180	7.00				1247	
000	127	2009	166	3107	182	3642	175	3400	2		
000187	071			7026	: 70	3642	172	3460	170	3345	-
32,000	132	2422	791	1016				2400	167	3447	
36,000	136	2442	85	3107	2	7600			0	27:7	
	1	1046	151	3107	99	3642	159	3400	13,		•
40,000	1 3 4	2027			-						

VELOCITY LIMITS TABLE (INCLUDING FUEL FLOW RATES)

PRESSURE: 4000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPH

ION VELOCITY NEVER	-		(K   2)			760	3455 170 270	-	3455	3167	1	3455 170 3197	-	3455 150 6770	3455 114 2296	
 TRANSMISSION LIMITS		7 2	(KTS) (LBS/HR)				189 34	-	185 34	-	182 34		, , , , , , ,	173 36	-	701
# # C	(ENGINE)		(VTS) (185/HR)			**	244.	1000	777	185	3464	+	179 3464	7.22 3464	2/3	1956
AX	CONTINCO	+	F - T - T - T - T - T - T - T - T - T -	11.03.00				2738		2738		2738	2738		2738	
*	1 KOO	2	. J ii   Iii   X	(K15)				571		161		158	12.1	- 61	148	
920	RANGE		. 4 . 4	(L85/HR)				97.	06/1	1893		2091		2311	2547	
	ı ox		737	(KTS)					124		171	132		136	140	
L	<u></u>		<b></b>		GROSS	びとこの	( 58 )		20,000		24,000	000 86	20107	32,000	000	20000

TABLE 4-68

TEMPERATURE: (INCLUDING FUEL FLOW RATES) VELOCITY -LIMITS TABLE PRESSURE: 6000 FT

235 RPM AIRCRAFT - CH#47C

					<b>-</b> -	<b></b> -		
VELOC1TY NEVER Exceed	VEL F.F.		3441	3686	3953	4220	6644	3283
VELOC1	VEL (KTS)		170	: 70	170	170	170	145
TRANSHISSION LIMITS	VEL F.F.		3262	3262	3262	3262	3262	3262
TRAN	VEL (KTS)		991	791	158	154	150	144
POJ POJ POJ POJ POJ POJ POJ POJ POJ POJ	VEL F.F.		3816	3816	3816	3816	3816	9186
- G - G - G - G - G - G - G - G - G - G	VEL (KTS)		111	172	168	<u>ī</u> 63	159	154
TAX ONTINO POWER	EL F.F. TS) (LBS/HR)		3729	3729	3729	3729	3729	3729
CONT	VEL (:TS)		176	171	166	162	158	152
LONG	F.F. (LBS/HR)		1488	1682	1907	2097	2257	2152
-302	VEL (KTS)		110	114	120	122	121	123
		GROSS WEIGHTS (LBS)	20,000	24,000	28,000	32,000	36,000	40,000

VELOCITY LIMITS TABLE INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCRAFT - FH-47C 235 RPM

		7	<u> </u>	_		<del></del>		
VELOCTTY NEVER Exceed	VEL F.F.		0002	$\downarrow$	$\bot$	3545	3637	2786
VELO	VEL		170	170	170	170	167	139
TRANSHISSION LIMITS	VEL F.F. (KTS) (LBS/HR)		3300	3309	3309	3309	3309	3309
T A A A A A	VEL (KTS)		179	172	168	164	160	153
P MAX POWER (ENGINE)	VEL F.F.		3593	3593	3593	3593	3593	3593
END T	VEL (KTS)		187	179	175	171	99!	159
MAX CONTINUOUS POWER	EL F.F. TS) (LBS/HR)		3268	3268	3268	3268	3268	3268
CONT	VEL (KTS)		178	171	167	163	159	152
LONG Range	F.F. (LBS/HR)		1542	1736	1938	21,65	2353	2451
-J (E	VEL (KTS)		115	121	125	130	131	126
		GROSS WEIGHTS (LBS)	20,000	24,000	28,000	32,000	36,000	40.000

VELOCITY LIMITS TABLE (INCLUDING FUFL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 235 RPH

CHINDOK

TRANSHISSION VELOCITY NEVER EXCEED	VEL F.F.	C X Y		0/1 Bacc		3356		
P D R R R R R R R R R R R R R R R R R R	VEL F.F.		188 3382	-	+	-	169 31A2	_
MAX CONTINUOUS POWER	VEL F.F.		172 2887	168 2887	164 2887	160 2987	153 2887	
LONG	KTS) (LBS/HR) (K		121 1615	125 1781 1	130 1983 1	135 2221	137 2431 1	
	( < 8	GROSS WEIGHTS (LBS)	20,000	24,000 12	28,000 13	32,000 13	36,000 13	

TABLE 4-71

VELOCITY LIMITS TABLE INCLUDING FUEL FLOW RATES)

PRESSURE: 6000 FT TEMPERATURE: 35 C

AIRCRAFT - CH-47C 235 RPM

CHINDOK

7		r				_		7	_		1		Т	-	
VELOCITY NEVER Exceed		(KTS) (LBS/HR)			2333	27.36	2838		2926	2044	21.3	2188		2166	
VELOCT	4 4	(KTS)				170	170		170	7 , .	001	124		82	
TRANSHISSION LIMITS		(L85/HR)				3407	2407	1015	3407		3+07	7037	, ,	3407	<b>*************************************</b>
TRANS		VEL (KTS)				195		041	188		184	. 1.0	7/1	191	
<b>₹₩</b> ₩₩ ₩₩		(1,85/HR)				3218		3718	3218		3218	0.00	3718	3218	
E C C C C C C C C C C C C C C C C C C C	200	(KTS)				188		184	1 8 .	201	176		901	73:	1 30
MAX MATINO	#E.A	(LBS/HR)	•			2548		2548	2 2 2 2 2	0167	2548		2548	25.40	0167
CONTI	2	VEL (KTS)				163	•	160		120	151		143	000	061
LONG		VEL F.F.				1674		1847		c 5 0 2	2276		2503	70,0	06/7
78		VEL (KTS)				121	150	130		135	138		141		142
<b>L</b>		<b></b>		GROSS	(182)	20.00	0000	24.000		28,000	32.000		36,000		40,000

TABLE 4-72

VELOCITY LIMITS TABLE

AIRCRAFT - CH-47C 235 PP PRESSURE: 8000 FT

VELOCĪTY NEVER Exceed	(LBS/HR)		3270	3531	3800	4072	4232	3014	
VELOCT EX	VEL (KTS)		170	170	170	170	167	139	
TRANSMISSION LIMITS	(LBS/HR)		3256	3256	3256	3256	3256	3256	
T R A N I	VEL (KTS)		170	164	160	155	151	<b>5 1 1</b>	
A SUN	(_BS/HR)		3536	3536	3536	3536	3536	3536	
1 Z Z	VEL (KTS)		175	170	165	191	155	149	
MAX ONTINOUS POWRR	F.F. (LBS/HR)		3477	3477	3476	3476	3477	3477	)
NOO NOO	VEL (KTS)		174	169	164	159	154	148	
LONG RANGE	(LBS/HR)	·	1464	1638	1872	2036	2197	2491	
-Jez	VEL (KTS)		112	711	122	122	120	124	
<b></b>		SROSS WEIGHTS	20.000	24.000	28.000	32,000	36,000	40,000	

TABL: 4-73

TEMPERATURE: (INCLUDING FUEL FLOW RATES) Pressure: 8000 ft temperature: VELOCITY LIMITS TABLE

235 RPM

AIRCRAFT - FH-47C

					3		2 4 0 1	Notaria	VELOCY	TY NEVER
	.X) فــ	70 N C N C N C N C N C N C N C N C N C N	SOUTINOOUS POWER	××××××××××××××××××××××××××××××××××××××	POSX POSX POSX POSX POSX POSX POSX POSX	NE N	L 1	LINITS	E	ExCEED
	VEL (KTS)	VEL F.F.	VEL	E E	VEL (KTS) (	( BS/HR)	VEL (KTS)	F.F.	VEL (KTS)	F.F. (LBS/HR)
GROSS WEIGHTS (LBS)										
20,000	116	1488	174	3024	182	3336	181	3289	170	2883
24,000	123	1705	691	3024	176	3336	175	3289	170	3069
28,000	127	1900	165	3024	173	3336	172	3289	170	3212
32,000	131	2120	160	3024	168	3336	167	3289	170	3405
36,000	127	2224	154	3024	161	3336	160	3289	151	2150
40,000	131	2557	146	3024	153	3336	152	3289	107	4137

TABLE 4-74

TEMPERATURE: 15 C (INCLUDING FUEL FLOW RATES) VELOCITY LIMITS TABLE

AIRCRAFT - FH-47C 235 RPM PRESSURE: 8008 FT

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C		
C	)	١
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-	-	•
1	1	į
•		1
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		_		_		T		T		T		Γ	T		Γ	7		
1	VELOCITY NEVEN		1 D S / H R )				2476		2790		2931		2869	2086		0		
•	VELOCI		)     (	(K13)				1/0			170		162	120		0		
	TRANSHISSION LIMITS		L	(LBS/HR)				3327		3327	-0.5	3327	3327		3327	3327		
	TRANS		2	(KTS)				193		188		183	177		167	1 2 2	827	
	×	INE)		(, BS/HR)				200	2010	2172	3010	3132	3 . 3 .	3132	3132		3) 32	
	(X) (X) (X) (X)	524		VEL (113)	1				186		182	- 177		171	67:	7,27	151	
	۸×	SOONIE	Z L	14 · C	11.05/11				2670		2670		2670	2670		2670	2670	
	Ξ	ととうし	04	V € L	_				170		166		161	156		148	137	
	970	2 Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z		ia.	(KTS) (LBS/HR)				773.	0000	1724		1956	2185		2399	34.38	6030
	-	300		- 32	(KTS)					123	, ,	971	132		136	138		135
	<b></b>					99000	0 1 2 C 1 3	C C C C C C C C C C C C C C C C C C C		20,000		24,000	20.00	20107	32,000	34.000	2000	40,000

TABLE 4-75

TEMPERATURE: 35 C (INCLUDING FUEL FLOW RATES) VELOCITY LIMITS TABLE PRESSURE: 8000 FT

**235 RPH** AIRCRAFT - CH-47C

 				7		7		T		r	Т			1	
VELOCITY NEVER Exceed	. 6 6	(KTS) (LBS/HR)			•	2183	3279	, , , , ,	2396	0 : 0	2110	1962	c		
VELOC:		(KTS)				155	3 4 7	25.	55		134	92	•		
TRANSMISSION LIMITS		(LBS/HR)				3369		3369	0711	255	3369	9366		3367	
TRANS		VEL (KTS)				200	22	197			185	3.5		156	
0.3 ₹\$\ M× M	INE	F.F.				200	6703	25.83		2983	2983	0000	6703	2983	
EO	9 N W )	VEL (715)				70-	1 80	7 8 7		179	. 70	,	159	37.	
MAX	MER	F F F 6 7 1 1 2 1 2 2 2 2 2 2 2 3 2 3 2 3 2 3 3 3 3				, ,	2356	7316	0007	2356	2364	9567	2356	7366	6000
TNOC	9	VEL	2 2				161	0 1 .	150	153	, ;	0,5	135		0 1 1
L ONG	1	VEL	(TB3/UV)				1602	,	1794	2013		5422	2498		2893
-10	٤	VEL	(KTS)				127		132	137		141	141		7 7 7
hamm-				GROSS	S 1 2 3 1 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	15021	20,000		24,000	28.000		32,000	36,000		40,000

TABLE 4-76

VELOCITY LIMITS TABLE (INCLUDING FUEL FLOW RATES) PRESSURE: 10000 FT TEMPERATURE: -29

AIRCRAFT - CH-47C 235 RPM

ANGE ANGE (LBS/HR) (	-	CONTI	MAX NTINUOUS POWER L F.F.F.	(ENGINE)	AX NED INED (INED (INED (INED)	TRANS LI VEL (KTS)	TRANSHISSION LIMITS VEL F.F.	V E L O C K T S )	VELOCITY NEVER ExCEED  VEL (KTS) (LBS/HR)
1420 172 3206	2	3206	1	173	3277	173	3261	170	3122
1635 166 3206	2	3206	†	168	3277	167	3261	170	3390
1819 161 3206	<u> </u>	3206	<del></del> -	163	3277	162	3261	1.70	3658
1981 156 3206	,	3206	<del></del> -	158	3277	157	3261	170	3948
2247 150 3206		3206	┺	151	3277	151	3261	151	3289
2503 142 3206	2	3206	L	143	3277	143	3261	104	2213
			1						

TABLE 4-77

VELOCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PRESSURE: 10000 FT TEMPERATURE: -5 C
AIRCRAFT - ÉH-47C 235 RPM

	VELOCITY NEVER Exceed		. 11. 11	(LBS/HR)			2736		2893		3067	2927	1	2030	ပ		
	VELOC E		727	(KTS)			15		170		170	091		1 2	0		•
A	TRANSHISSION			(LBS/HR)				3242	3292		3292	3293		3292	3292		
	TRAN	À		VEL (*13)				185		200	176		101	160		) 	
	Ax	Z W Z		(, BS/HR)				3075		3075	3075		3075	3075		30/2	
	E	POXEX PX612EX		VEL				. 80	2	175		2	164	22.	2	~	
	HAX	SOUNTINO	<b>■</b>	F • F •	(Las/mr)			2701	1017	2787		2787	2787		2787	2787	
		CONT	ĭ	VEL	(KTS)				172	147		162	156		4 00	137	
	9170	RANGE		F . F .	(LBS/HR)				1459	677	7001	1885	2005	2002	2187	0.75	0107
		ח פכ			(KTS)		-		120		125	130		127	126		131
	<b>.</b>					GROSS	S I US I US	15031	20.000		24:000	28,000		32,000	36,000		40.000

TABLE 4-78

VELOCITY LIMITS TABLE

(INCLUDING FUEL FLOW RATES) Pressure: 10000 ft temperature: 15 c

AIRCRAFT - TH-47C 235 RPM

CHINOOK

	T	<del></del>		-	_			
VELOCITY NEVER	F.F.		2018	2123	2258	2003	1893	0
VELOCY	VEL (KTS)		151	15.1	151	130	88	0
TRANSHISSION LIMITS	F.F. (LBS/HR)		3317	3317	3317	3317	3317	3317
TRANS	VEL (KTS)		198	194	187	178	164	151
E P S S S S S S S S S S S S S S S S S S	F.F.		2904	2904	2904	2904	2904	2904
I O O	VEL (KTS) (		184	1.80	174	166	155	140
MAX ONTINUOUS POWER	F.F. (LBS/HR)		2465	2465	2465	2465	2465	2465
CONT	VEL (KTS)		168	163	158	151	140	121
RONG RANGE	F.F.		1507	1699	1942	2144	2355	2775
_G	VEL (KTS)		125	130	135	137	135	135
,		GROSS WEIGHTS (LBS)	20,000	24,000	28,000	32,000	36,000	40.000

115

TABLE 4-79

VELOCITY LIMITS TABLE (INCLUDING FUEL FLOW RATES) SURE: 10000 FT TEMPERATURE: 35 C

PRESSURE: 10000 FT TEMPERATURE: 3 AIRCRAFT - CH-47C 235 RPM

CHINOOR

OF TH NEVER	Exceed		(MI/VO - ) (MI/V				373	23		123 1500	25.	123	1277		-	d			
				+			-		-			-		-					
	TRANSMISSION LIMITS			(LBS/HR)			-	3347	$\downarrow$	3347	+	3347	23.6.2	$\downarrow$	3347	2347	1		
				(KTS)			1	207	2	200	3	661	+	162	167		148		
	0	1 NE)		( BS/HR)					7/01	276.	10/7	2761		2761	2761		2761		
	10	(ENG		(KTS)				-	100		189	1	1/5	162	0.7	1 4	129	1	
	MAX		3	VEL FOFT	1001				2175		2175		2175	2175		2175	2175		
!		200					~~			2	156		149	05-		119	10	>	
	ONO	RANGE		9 4 9 4	(KTS) (LBS/HR)	***************************************				1551	2764		1987	186	0177	2569		1647	**************************************
		œ		13/	(KTS)					129		134	011		1,1	182	3	136	
	<b>L</b> _					T and a	いたまででは	(58.1)	,	20.000		000042		000.682	32,000		20000	100010+	

## CHAPTER 5

AND THE WAS A SECRETARY STATE OF THE WAS A STATE OF

## CHINOOK (CH-47C) PERFORMANCE DATA TABLES (245 RPM)

## **GENERAL**

These tables are the additional ones needed when the CH-47C is operated at a gross weight in excess of 40,000 lbs. These are for 245 RPM engine usage and are supplemental to the tables in Chapter 4. The tables are organized in the following manner:

Tables 5-1 to 5-24	Basic Fuel Flow Data
Tables 5-25 to 5-48	Delta Fuel Flow for Drag Data
Table 5-49	Ground Idle Fuel Flow Data
Tables 5-50 to 5-55	Gross Weight Limits Data
Tables 5-56 to 5-79	Velocity Limits Data

BASIC FIEL FLOW DATA

TABLES
(245 RPM)

TABLE 5-1

DASIC FULL FLUW

FUEL FLUW KATES FUK THE GIVEN CUNDITIONS IN LBS/HR
PRESSURE: SLA LEVEL TEMPERATURE: -25 C
AIRCHAFT - CH-47C 245 KPM

CHINGUR

	-			31 12	11 CHT MOOF (KTS)	(KTS)	_			
15080										7
SHIP	130 120 140 150 140 150 140 150 140 150 150 150 150 150 150 150 150 150 15			777	:, 4	38	701	120	2	
	H	コワクド	بر 2 2	=		•				
15071	· ·	0 230				3	2000	., 27.	3661	52p
		1000	2 77 76.	2441	2214	2100	1767	6/,7		
40.000	7584	C	6107	7 7						3
					7000	2264	2406	7874	1/15	4
	2408	22.98 2979 2780 2541 23114 22	2760	.254I	F 1117					
44,000	3						0000	,00		260
		2349 2710 210 210 2349 2349 2349	0000	6447	7394	2349	0 / 1 7	01.7		
111111	1187	07.70	2007	2						0 1
	24.3 24.3 3083 403/ 3/7			1	3 3 7 6	2434	2593	3083	403/	
	3000	850	3004	2750	0017	>			_	
46,000	C717		2							

TABLE 5-2

HASIC FUEL FLUM
FUEL FLUM RAILS FUR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: SEA LEVEL TEMPERATURE: "5 C
AIRCRAFT - (H-47C 245 NPM

*	4
	2
2	2
2	
-	1
•	

84049				FL16	FLIGHT MODE (KTS)	E (KTS	~			
MEIGHTS (LBS)	HIGE	HIGE HOGE NOE	NOE	40	40 65 40 100 12n 140 16n	ÛR	100	120	140	160
40.000	2675	2675 2950 2726 2502 2248 2181 2275 2564 3225 4261	2726	2502	2246	1815	2275	4952	3228	1924
42.000	6817	2789 3092 2849 26US 2341 2266 2359 2648 3316 4383	2849	2605	1462	2266	2359	8697	3316	FREH
44.000	2405	2405 3241 2918 2715 2438 2355 2444 2756 3415 4517	8/67	2715	2438	2355	2444	9517	3118	1154
46.000	3026	3026 3398 3114 2830 2540 2445 2531 2850 3522 4607	3114	2830	2540	2445	2531	785n	3522	1994

TABLE 5-3

BASIC FULM
FUEL FLUM RAIES FUR THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: SEA LEVEL TEMPERATUME: 15 C
AIRCHAFT — CH-47C 245 KPM

•			
•			

SKONS	į			FL16	FLIGHT MODE (KTS)	(KTS)				
#E16HTS (LBS)	HIGE	HIGE MOGE NUE 40 60 80 100 120 140 160	NUF	40	Ωø	90	100	120	041	160
40.000	2760	2760 3058 2816 2573 2301 2206 2274 2512 2985 3807	2816	2573	2301	22U6	2274	7197	2985	1080
42,000	2879	2879 3213 2950 2687 2402 2297 2357 2592 3098 3897	2950	1897	2405	2297	2357	7657	3698	1880
44.000	30n3	30n3 3375 3091 28uc 25u7 2368 2446 2673 3191 3994	3091	2800	2507	2368	9447	5673	1616	7665
46,000	3136 3543 3237 2932 2615 2481 2538 2757 3288 4108	3543	3237	2632	2615	2481	2538	1917	3288	4108

TABLE 5-4

BESIC FUEL FLUM FUEL FLUM RAIES FUM THE GIVEN CUNDITIONS IN LUS/HR PRESSURE: SEA LEVEL TEMPEMATUME: 35 C AIRCRAFT - CM-4/C 245 MPM

CHINOCK

	_	_	_	_	-	_		-		_		_
		140			7/50		3654		クオトゥ		J854	)
		041			7147		2447		3076		3163	
		120		7071	6112	, 434	9/67		7627		2745	
_		100		2293			4 > 4	2426	6112		25/3	
E (RTS	1	O ¥		2254		2345		2430	1017	25.30	9567	
HT HOU		၁ <b>9</b>		2370		2478		25.40		27.01	11179	
9175		Î		5656		2780		2916		2000	20.00	
		NOE	, . 0	: 1 x 2 !		3000		3211		3367		
	HOGE	3000	11.74		17 17 17	3340		3514		3690		
	HIGE		7446		20.21	5 / K 7		3115		3258		
*E10175	(685)		40.000		42.0		2000	000	777	000.01		
	REIGHTS	TS HIGE HOSE	HIGE HOGE NUE 40 60 60	HIGE HOGE NUE	TS HIGE HOGE NUE 40 60 60 60 60 60 60 60 60 60 60 60 60 60	2646 3174 2915 2656 2370 2254	2646 3174 2915 2656 2370 2254 2974 3340 3n60 2780 2478 2345	S FLIGHT HODE (NTS)  HIGE HOGE NUE 40 60 60  2846 3174 2915 2656 2370 2254  2974 3340 3060 2780 2478 2345	2974 3340 30 2780 2478 2345 3112 3514 3211 2916 2478 2345	S HIGE HOGE NUE 40 60 60 2846 3174 2915 2656 2370 2254 2974 3340 3060 2780 2478 2345 3112 3514 3211 2910 2589 2439	2646 174 2915 2656 2370 2254 2974 3340 3060 2780 2478 2345 3112 3514 3211 2910 2589 2439 3258 3690 3367 3046 270	5 High Hode NUE 40 60 60 2846 3174 2915 2656 2370 2254 2974 3340 3060 2780 2478 2345 3112 3514 3211 2910 2589 2439 3258 3690 3367 3045 2701 2535

TABLE 5-5

BASIC FUEL FLOW
FUEL FLOW RAIES FOR THE GIVEN CUNDITIONS IN LES/HR
PRESSURE: 2000 FT TEMPERATURE: -25 C
AIRCRAFT - CH-47C 245 HPM

*F. 6415				FL 1	FLIGHT MODE (KTS)	E (KTS	-				
(685)	HICE	HICE HOLE		L							
	301	35011	אמע	<u> </u>	Ü9	08	100	120	120 140 140	140	1
40.000	2442	46.00						- [	2		_
,	700	207	5707		2411 2185 2145 2277	2145	2277	27.20	34.70	4	_
42.000	7676	11 6 9 1						6.611	0 / 6 6	2010 0165	
000:-:	0/03	£ / 6.7	77.44	2515	2515 277 277	2231	2231 2362	2830	27		7-
0.70.44	1 2 2							67.7	2016	9156 2016	_
000	16/7	4/91 3121 2873	2873	2625	2373	2319	2319 2471	•			-
44.000	3220							+6.7	0101	122	_
000	4047	19/25 14047	3010	2742	3010 2742 2474 2410 2573	2410	2573				_
			A		)	-	ーつ・ロリ	1 1 1		- r	_

TABLE 5-6

BASIC FUEL FLOM FUEL FLOM MATLS FUM THE GIVEM CONDITIONS IN LBS/AR PRESSUME: 2000 FT TEMPERATUME: -5 C

AIRCHAFI - CH-47C 245 KPM

CHINCOR

	_	_	T	_	_	_	_	7	_	_	_		_	_	_
				190 190		4 1 4 2	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		1280	2	1 2 1	> o r		44.	c .
				) T		3179 4117			3233		3244		1	75957	
			120	17.		2500		, 7.	+ 107		77.0	:		- 1 97	
	~		100		2.5	2633		2220	7377		240%		2503	4004	
	SIY) 3		0.90		37.0	4117		2238	)	6.5	1369		74.77		
1	(SLY) BODE (VIS)		ဘ္ခ	1131	0110	7777	T o	7777	1281 1233 1738 1 12811 1323	3436	2,00 2123 2369 2409 7710 3344 400	3022 3427 313	2537		
37 13	2	1	2		12474		. 20 0	2007		7706			6633		
		71174	30.1	3	70/y		0000			2963		2	2011		
		HIGE HOGE		1040			2010			4526   D469		7705			
		H 1 GE		4648			4/66 J 3078			0 / 6 %		3022			
でなった。		15071		40.00.0	,	42.000					7 7 7	2000	-		

TABLE 5-7

BASIC FUEL FLOW
FUEL FLOW RATES FOR THE GIVEN CUNDITIONS IN LUS/NH
PRESSURE: 2000 FT TEMPERATURE: 15 C

AIKCHAFT - CH-47C 245 KPH

35049				P 1 1 6	FLIGHT MUDE (NIS)	5 K .	_			
J 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						3		120	24.5	- 90
	HIGE	HIGE HOGE 40 40 00 00 40 400 301	30 E	2	09	) 0	0		2	
						1	5 6 7 6	1111	2924	3664
000	27.25	2735 3064 2809 2554 2283 21/8 2233 278 2/3	2809	2554	2283	21/8	5577	81.7	. 7 / 7	
2000	3	,					7000	5.3.	30.10	3775
57.70	7064	201 3229 2953 2677 4390 22/1 2364 231 July	2953	2677	2380	22/1	2357	1007		
000.75		•						, , ,	2 0	3944
131.11	3002	3003 3400 3103 2807 2499 2365 2416 2016 3117 3013	3103	2807	5466	2365	2410	7010	6110	5.00
000									22.11	40.40
3. 3 7.	3147	3147 3579 3261 2943 2609 2460 2514 2106 3222 1055	3261	2943	2609	2460	2514	90.7	2775	

TABLE 5-8

BASIC FUEL FLOW
FUEL FLOW RATES FUR THE GIVEN CUNDITIONS IN LUS/HR
PREJSURE: 2000 FT TENPERATURE: 35 C
AIRCRAFI - CM-47C 245 RPM

FLIGHT MUDE (KTS)	NUE 4n 60 80 100 12n 140 160	2830 3187 2916 2646 2350 2224 2258 2433 2822 3441	2972 3362 3070 2778 2468 2319 2354 2519 2907 3543	3122 3545 3231 2916 2580 2417 2455 2609 2997 3603	3277 3741 3403 3n65 2697 252n 2562 271n 3101 3804
5)		22	23	24	25
E IRT	08	2224	2319	2417	2520
HT MGD	09	4350	2468	2580	2697
F L 1 G	40	2640	2778	2916	3065
	BON	9142	3070	3231	3403
	HOGE	1818	3362	3545	3741
	HIGE HOGE	2830	2472	3122	3277
K055	LBS)	40.000	42.000	44.000	46,000

TABLE 5-9

HASIC FULL FLUM FUEL FLOM RAIES FOR THE GIVEN COMULTIONS IN LUSINK PRESSURE: 4000 FT TEMPERATURE: -25 C

AIRCHAFT - CH-47C 245 KPH

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<

2542 4834 2612 2390 2162 2115 2253 2677 3567 5033	35
67	
3 2	3 278
225	225.
2115	2115
2162	2162
2396	2396
2612	2612
4834	2987
2545	2542
	2659 2967 2745 2504 2261 2205 2353 2789 3663 5234

TABLE 5-10

BASIC FUEL FLOW
FUEL FLOW RATES FOW THE GIVEN CUNDITIONS IN LUSINR
PRESSUKE: 4000 FT TEMPERATURE: -5 C

AIRCHAFI - CH-47C 245 HPM

SKOSS FROSS				FL 1 6	FLIGHT MUDE (KTS)	(KTS				
, (KR)	i de la constantina della cons	HO 66	, ; ;							
	307	100E	7 O F	0.	<b>3</b>	000	00 100 120 140 160	120	140	160
40.000	2630	2630 2956	2708	1942	2708 2461 2207 2124 2196 2475 3057	2124	2198	2475		105/
"3										,
. 000.21	8517	4758 3121	2823	2585	2313 2216 2289 2574 3173 4222	2216	2289	2574	3173	4242
77.77										
000	4845	4875 3275	3006	2716	3006 2716 2422 2307 2385	2307	2385	2678 3297	3297	4400
200 70										)
10.00	0+05	3040 3461 3167 2853 2534 2403 2486 2787 3478	3167	2853	2534	2403	2486	2787	3478	4602

TABLE 5-11

BASIC FUEL FLUW FUEL FLOM RATES FUN THE GIVEN CONDITIONS IN LUSIMN PRESSURE: 4000 FT TEMPERATURE: 15 C

AIRCHAFT - CH-47C 245 RPM

GRUSS FLERTS				F.L.16	FLIGHT MODE (KTS)	E (KTS	•			
(587)	HIGE	HIGE HOGE	NOE	940	0.9	1	100	60 10C 12n 140 160	140	160
40,000	2727	2727 3083 2816 2550 2273 2155 2203 2393 2853 3564	9182	2550	2273	2155	2203	2393	2853	1564
42.000	2870	2870 3258 2971 2684 2383 2250 2299 248n	1 2 6 2	7684	2383	2250	5622	248n	2955	2955 3695
44,000	3019	3019 3446 3135 2825 2495 2347 2401 2574 3063 3850	3135	2825	2445	2347	2401	757	3063	1850
46.000	3173	3173 3650 3311 2973 2613 245n 2509 2681 3184 4042	3311	2973	2613	2450	2509	7681	3.84	4040

**TABLE 5-12** 

BASIC FUEL FLUM
FUEL FLUM KAIES FUN THE GIVEN CUMDITIONS IN LUSZHK
PRESSUME: 4000 FT TEMPEMATUME; 35 C
AIRCHAFT - CHM47C 245 APM
CHINOUR

SKUNS				F L 1 G	HI HOU	FLIGHT MUDE (RIS)	_			
(CB)	HiGE	HIGE HOGE NUE	NCF	2.5		63 8G 10U 12n 14U 16D	100	120	140	160
40.000	2634	2434 3212 2930 2649 2346 2202 2236 2383 2743 3340	2930	5492	2346	2202	2236	2383	2743	J340
42.000	2987	2987 3402 3097 2793 2462 2302 2340 2479 2840 3480	3077	2793	7967	2302	2340	6247	2840	3480
44,000	3145	3145 3608 3276 2945 2583 2409 2451 2591 2959	3,76	2945	2583	60 42	1542	1652	6562	2643
46,000	3310	3310 3825 3465 3106 2715 2526 2570 2727 3137 3843	3465	3106	2715	2526	2570	2727	3137	2843

TABLE 5-13

BASIC FUEL FLUM
FUEL FLUM KAIES FUN THE GIVEN CUNDITIONS !N LUSZHR
PRESSURE: 6000 FT TEMPERATURE: "25 C

AIRCHAFT - CH-47C 245 HPM

Šenas				P. 16	FLIGHT MUDE (KTS)	E (KTS				
#E [6H] 5	HIGE	HIGE HOGE	301		90	ОЯ	160	4n 60 80 16C 120 140 190	140	100
40.000	2529	2529 2854 2619 2385 2152 2UP3 2237 2648 3488 1965	2619	5867	2152	2093	22.37	2648	3488	1965
42,000	2655	2655 3024 2766 2509 2260 2188 2345 2769 3677 5188	2766	2509	2260	8812	2345	2769	3677	5166
44.000	2192	2792 3206 2923 2440 2364 2286 2460 2899 3866 5432	2923	2640	2365	9872	2460	6687	3866	2432
96.000	494 3408 4808 285 2867 2865 845 865 8045 8045 8165	3408	30.54	2780	2482	2387	2582	3036	4065	2690

TABLE 5-14

DASIC FUEL FLOW
FUEL FLOW RATES FUN THE GIVEN CONDITIONS IN LBS/HR
PRESSURE: 6000 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 245 KPM

CHINGUK

		-									
				F 1 6	FLIGHT MODE (KTS)	. CKTS	_				
なれつより	•								, ,	•	
5 エラール	H 1 (2 F	HIGH HOGE NUE	NUE	9	09	08	40 60 80 100 120 140 160	120	2 7	001	
1001								. 44	2000	1001	
0.00	26.20 7005 1245 2262 2104 21/3 2141 3007	7985	2725	5987	7522	2104	5113	1417	2000	500.	_
200.01	,70.					(			31.5	10.1	_
0000	2770 3165 2882 2600 2313 2177 227 2518 3139 11.	3165	2882	2600	2313	2177	7/77	7248	2132	8 . 1 .	_
44,000							,	1	2274		_
0.00	2021 3361 3051 2741 2427 2276 23/1 2703	1928	3051	2741	2427	2276	23//	:017	241		
0000	77.							-	0	444	_
	3077 358 3738 2891 2547 2402 2471 2772 3437 307	35.85	3738	2891	2547	2402	2471	2172	2437	1001	-
		֡֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜									

TABLE 5-15

BASIC FUEL FLUW
FUEL FLUW HAIES FUK THE GIVEN CUNDITIONS IN LBS/HR
PRESSUKE: 6000 FT TEMPERATURE: 15 C

AIRCHAFT - CH-47C 245 HPM

GRUSS				FL16	FLIGHT RODE (KTS)	E (KTS	_			
*E16H15 (LBS)	H16E	HIGE HOGE NOE	NOE	40	20	90	40 60 80 100 12n 140 160	12n	0 6 1	160
40.000	2739	2739 3118 2840 2562 2266 2137 2185 2346 2796 3505	2840	2562	2266	2137	2185	2346	2796	3505
42.0UC	2891	2891 3315 3011 2707 2383 2237 2290 2449 2913 3680	3011	2707	2383	2237	2290	6447	2913	2683
44.000	3050	3050 3532 3196 2860 2507 2346 2404 2569 3056 3904	3196	2860	2507	2346	2404	6957	3056	2904
46.000	3219	3219 3771 3397 3023 2643 2467 2526 2748 3236 7186	3397	3023	2643	2467	2528	2748	3238	1186

TABLE 5-16

BASIC FUEL FLOM
FUEL FLOM RAIES FUR THE GIVEN CUNDITIONS IN LBS/HR
PRESSURE: 6000 FT FEMPERATURE: 35 C

AIRCHAFT - CH-47C 245 HPH

CHINCUR

6K05S				173	HT HOL	FLIGHT MODE (KTS)	-			
(FBS)	HIGE	HIGE HOGE NUE	NUE	0 <del>h</del>		De	<b>10</b> 0	60 80 100 12n 140 16n	140	160
40.000	282	2852 3261 2945 2669 2346 2190 2228 2355 2693 3309	5962	5997	2346	2190	2228	4367	2693	4364
42,000	3014	3014 3474 3150 2826 2473 2303 2343 2481 2854 3493	3150	2826	2473	2303	2343	1847	2854	2493
44,000	3186	3186 3700 3347 2994 2614 2428 2469 2635 3034 3724	3347	4667	4192	2428	5469	2635	3034	37.24
46.000	3370	3370 3954 3567 318n 2/71 2566 2603 2812 3253 402A	3567	3180	2/71	2566	2603	7187	3253	400°

TABLE 5-17

BASIC FUEL FLOW
FUEL FLOW RAIES FOR THE GIVEN CONDITIONS IN LUS/HR
PRESSURE: BOOG FT TEMPERATURE: -25 C
AIRCRAFT - CH-47C 245 NPM

GRUSS SEIGHIS				FLIG	HT NO	FLIGHT MODE (NTS)				
(188)	HIGE	HIGE HOGE NUE	NOE		09	40 60 80 100 12n 140 16r	100	12n	140	165
40,000	2533	2533 2898 2647 2395 2151 2080 2235 2635 3508 4937	2647	2395	2151	2080	2235	2635	3508	4937
42,000	2677	2677 3092 2812 2531 2269 2180 2353 2770 3704 5194	2812	1637	2264	0812	2353	2770	3704	761c
44.000	2831	2831 3314 2996 2677 2381 2283 2481 2919 3912 547H	7646	1197	1852	2283	1842	6167	3914	2478
46.000	7996	2996 3553 3194 2835 2503 2393 2618 3094 4143 5796	3194	2835	2503	2393	2619	3094	4143	5796

TABLE 5-18

BASIC FUEL FLOW FUEL FLOW KATES FUN THE GIVEN CONDITIONS IN LUSZHR Pressurft hopu ft temperature: -5 c

AIKCHAFT . CH-47C 245 HPM

				7.5						
	-	-		1 1 4	TELGAL MODE (ATS)	2E (ATS	~			
HIGE HOGE	190H		NOF	40	70		901 100	120	120	
2647 4037	40.37	-		1					2.1	001
2007 2/61 2485 2204 2089 2161 2422 2978	,,,,,,,		-	2445	2204	5089	2161	2422	2978	4004
2801 3248 24	3248 24	10	40	27.3.	3.3					
			3	1247	2362	717	2274	5248	3132	210 600 2102 2274 2545 3132 4242
2965 3499 3143 278H	3499 31	3.1	43	278H	2448	2446 2305 2390	2390	.40-		
			†	+				0407	415t 3320 751H	1 C L
3147 3/50 3357 295b	3/50 33	33	27	2950	2586	2429	254H	, A 4.	2586 2429 2548 JAL 3LUL 4.	7

TABLE 5-19

BASIC FUEL FLOW

FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LUS/HR

PRESSURE: 8000 FT TEMPERATURE: 15 C

Ľ	
245	
してオトエン	
-	
CKAF	
AIR	

GAUSS FIGHTS				FL 16	FLIGHT MODE (KTS)	DE (KTS	~			
(182)	HIGE	HOGE	NOE	υ <sub>h</sub>	<b>39</b>	0.8	1	120	100 120 140	160
40,000	2764	2764 3186	8882	L	2590 2274 2131 2182 2332	2131	2182	2332	2773	2773 3525
42.000	2929	2929 3417 3063 2749	3083	2749	2405	2405 2246	230%	7448	2939	3784
44.000	3108	3108 3674 3298	3298	2922	2550 2376	2376	2433	,	2667 3152	4067
46.000	3302	33n2 3954 3536 312n 2710 2518	3536	3120	2710	2518	2572	2862	2862 3416 4447	4447

TABLE 5-20

FUEL FLOW HATES FUR THE GIVER CUNDITIONS IN LUSTHR TEMPERATURE: 35 C BASIC FUEL FLOW

245 KPM PRESSURE: BUOD FT

AIRCHAFT - CH-47C

				,		3				
3.5				7116	FLIGHT MODE (NIS)	ר (א א	,			
NE LCHIS	3 \	40,04	200	40	09	9C	100		195	160
-5	297	, , :								
3	2444	28H4 3339	3023	27.08	3023 2706 2366 2200	2200	2238	2238 2375 2738	2738	4355
					1		3750	.540	2042	3617
42.000	3064	3064 3580	3233	3233 2886	2517	2303	1007	2517 2333 2307 2377		
)						3	1 1 1 7 7	1737	711	2941
44.010	3255	3865	3479	3092	5897	1057	0107	105 7 01C7 10h7 19897	200	
							7770	2034	7448	オーマナ
46.000	3459	3459 4173 3766 3339	3766	3339	2867	2012	2020	2867 2072 2030 2.37	2012	
ב כ		•		-					i	

**TABLE 5-21** 

BASIC FUEL FLOW FUEL FLOW RATES FOR THE GIVEN CONDITIONS IN LBS/HK Pressure: 10000 Ft temperature: -25 C

CKAFT = CH=47C 245 RPM

- 3			_	-	-	•	-	_	_	_	
			120 140 160		i	70 A P	ı	4970		#100 770L GING	
			140			2502		2/65	17. 277	7701	, , , , , ,
				ı	774		200	0107	7.07	2012	1366
	~		100		2749		2381 2182 23H; 38:2		2531		7696
	JE (KT:		96		2075		2182		2312		2452
	FLIGHT MODE (KTS)		79		4703 2703 2424 2161 2075 2249		4281		2411		2557
	F.L.1.		07		7424		2577		2745		29361
			NOF		2703		3224 2900		3111		3334
		1,000	יו שפר יוספר	. 000	2403		3224		4703 34/8 3111 2745 2411 2312 2531		3100 3/32 3334 2936 2557 2453 2694 32
		7-11	10 E	27	2057	,	4224		E 3 4 5 3	7	0077
01000	WE GHIS	(58.1)		000.00	0000	42 5446	34.1000	2000	000	46.010	2000

TABLE 5-22

FUEL FLOW RATES FOH THE GIVEN CUNDITIONS IN LBS/HR
PRESSURE: 10000 FT TEMPERATURE: -5 C
AIRCRAFT - CH-47C 245 HPM

	160	4017	1380	4737	१८१६
	140	3002	3236	35.26	3858
	120	4647	8657	4612	3037
<u>,</u>	100	8912	2318	2463	2623
DE INTS	၁မ	2091	2211	7344	2492
FLIGHT MUDE	<b>39</b>	2219	2353	2502	2668
1	40	2524	2687	2872	3095
	NOE	2831	3047	3267	3517
	HOGE	1416	3408	1978	3930
	HIGE	2684	2856	3051	3274
SKOSS.	(507)	40.000	42.000	44.000	46,000

**TABLE 5-23** 

and the property of the contract of the contra

DASIC FUEL FLUM FUEL FLOM KATES FUK THE GIVEM CONDITIONS IN LUSZHR PRESSUKE: IDUGU FT TEMPERATUKE: 15 C AIRCHAFT - CM-47C 245 KPM

CHINOCK

			167	1		9000		400			1 0 2 0	
			140	- [	24 74	, ,		1 / ()	3301		3030 3747	
		- 1	120		240	31	2500		2800	-		ł
	7	- 1	) )		2203		2346	- 1	2485		2639	
	DE INT		3		21511		2268		2440		2606	
	FLIGHT MODE (KTS)	[	ڊ. ه		2300 2151 2203		2461		2634	i	3337 2829 2606	
	F. J.			2676	4034		1747		3022	1	3337	
		3 T. N	-	2071	- 1	3000	F 0 7 2	1	200	17.5	66/2	
		HIGE MOGE		2610 3303		35.81		3867		3440 4173		
		HIGE		2610		2998		3706		3440		
64055	NEIGHIS -	(587)		000.01		0000.74		4.4.000		40.000		

TABLE 5-24

BASIC FUEL FLUW
FUEL FLUW RATES FOK THE GIVEN CUNDITIONS IN LBS/HK
PRESSURE: 10040 FT TEMPERATURE: 35 C
AIRCRAFT - CH-4/C 245 KPM

CHINCUR

				007		155		3626	T	7775		404	0
			777	?	2	6607	l	14216			+	3109 3419	
			120		. 44.	600	245	16.3	., 4.6.	2442		31091	
	(2		707		2271	•	2417	•	2510		Ja16 2747 37 50	12777	
	TELGH MODE (KTS)	٥	00		2241		2012 2001 2398		2567		2747		
177	20 %	37	Do		77.7		1007		8617		3016		
1	7 7			27.8.5				1000	1125		3646		
		NOF	1	3126	1	3394		3491	- 1	77	7066		
	1	H06E	1	2047		3780		4 PO 4		3624 4398			
		4 9	20110	7447		1 + 7 ?		3362		3624			
FEX.C.S.S.	(LBS)		40.000		42.000		210.44		46.000	000.01			
		1		1		1							

DELTA FUEL FLOW FOR DRAG DATA

TABLES
(245 RPM)

TABLE 5-25

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG Pressure: Sea level temperature: -25 c

AIRCRAFT - CH-47C 245 HPM

			AIR.	SPEE	AIR SPEED IN KTS	rs.		
		40	6.0	90	100	120	1 40	120 140 164
Dv.A.c.	50	17	8.5	137	264	459		862 1346
2	100	7.5	115 273	273	530 932 1759	932	1759	2674
THE THE	150	15	173	408	361 1456 2661 4∪38	1456	1992	40.38
3	200	89	230	544	68 230 544 1063 2028 3563 5384	2028	3563	5384

TABLE 5-26 CORRECTION FUEL FLOW LBS/HK FOR EXTERNAL DRAW

THE STATE OF THE PROPERTY OF T

PRESSURE: SEA LEVEL TEMPERATURE: -5 C

AIRCRAFT - CH-47C 245 RPM

CHINOOK

			1	K SPEE	AIR SPEED IN KTS	15		
		0,6	ó O	0.9	001	120	100 120 140	160
) u A G	20	91	55	161	750	428	969	1251
) : Z	100	<b>7</b> 6	601	652	264	958	9641	9192
CUNARE FECT	051	<b>4</b> 5	£91	386	9 h L	1296	1337	746 1296 2337 3773
	700	€9	217	513	666	1770	1512 993 1770 3180 5031	5031

**TABLE 5-27** 

CORMECTION FULL FLOW LBS/HM FOR EATERNAL URAS PRESSURE: SEA LEVEL TEMPERATUME: 15 C

AIRCHAFT - CH-47C 245 NPM

CHINCOR

			4 I 4	1.5.6.	AIR SEELD IN KTS	15		
		40	09	80	001		120 140	160
ORAG	50	51	75	473	439	402	049	10/1
, <u>.</u>	100	0ε	104	246	472	908	1308	2255
SWUARE FEFT	150	45	155	366	704	704 1208	2087	3430
	200	09	902	485	937	1625	485 937 1625 2671	1194

TABLE 5-28

CORRECTION FULL FLOW LBS/HR FOR LXTERNAL DRAG PRESSURE: SEA LEVEL TEMPERATURE: 35 C AIRCRAFI - CH-47C 245 RPM CHINOOR

	<b>3</b>		ALF	AIR SPEED IN KTS	N N	15		
					-			
		40	6,9		001	120	80 100 120 140 160	3
						3 6	,	1,0
	20	<b>*</b>	6 <del>1</del>	117	796   277	362	200	10
Z > C Z C C C C C C C C C C C C C C C C						,		100
	100	87	9	233	^ T	10)	107 1171 107	107
2								,
	150	42	147	348	999	141	668 1141 1867 317	316
CUISARE FEST							77 7 77	147.0
	200	26	50	194	/ 9 9	1223	124 1973 5761 188	167
		1						

TABLE 5-29

CURRECTION FULL FLOW LBS/HR FOR LATERNAL URAGE PRESSURE: 2000 FT TEMPERATURE: -25 C AIRCRAFT - CH-47C 245 MPM

			A E	Y SPEE	AIR SPEED IN KTS	15		
		40	09	08	1 00	120	140	100
DRAG	20	16	53	126	246	424	824	1251
Z	100	32	901	252	493	879	1663	2503
SWUARE FEET	150	2.6	651	378	740	740 1394 2501	1042	3754
	200	69	63 212	505		1922	992 1922 3339	5000

**TABLE 5-30** 

CURRECTION FULL FLOW LBS/HK FOR EXTERNAL DRAW TEMPEHATURE: -5 C 245 RPM AIRCHAFT - CH-47C PRESSURE: 2000 FT

CHINOOR

	•		A	SPEEU	AIR SPEED IN KTS	2	
		40	09	8.0	100	120	140
	5.0	15	5.0	611	730	399	629
9 X X	100	67	001	237	460	661	1425
2	051	77	6 + 1	354	691	9121	6072
SQUARE FEET	200	59	661	472	922 1680 2592	0891	2657

1174 2343

7894 3514

TABLÉ 5-31

CURRECTION FUEL FLOW LBS/HK FUR EXTERNAL URAG

PRESSURL: 2000 FT TEMPERATURE: 15 C

AIRCRAFT .. CH-47C 245 RPM

			4 T V	SPEE	AIR SPEED IN KTS	15			
		40	90	OR	100	120	140	100 120 140 165	
	50	1.4		47 113	218		965	373 596 1034	
۳ ۲ ۲	100	87	46	225	434	747	1233	94 225 434 747 1233 2121	
2	150	7.7	41 141 336	336	651	1125	9961	42E 1125 1966 3224	
SAUANE FEET	200	5.5	188	446	867	1519	2702	55 188 446 867 1519 2702 4324	

TABLE 5-32

CORRECTION FUEL FLOW LBS/HR FOR EATERNAL URAU Pressuke: 2000 ft temperature: 35 c

A13(RAFT ... CH.47C 245 RPM

CHINOOR

	•		A	K SPEE	AIR SPEED IN KTS	15		
		40	09.	80	100	120	100 120 140	160
	50	13	45	108	7.08	352	260	87%
5 ¥ × 0	100	97	89	412	412	705	1132	705 1132 1900
2	150	36	134	<u> </u>	919	1058	319 616 1058 1762	2943
SWUARE FEET	700	52	178	423	820	1417	2461	423 820 1417 2461 3977

TABLE 5-33

CUMPECITUM FUEL FLOW LBS/HR FOR EATERNAL URAG

PRESSURE: 4000 FT CEMPERATURE: ~25

AIRCHAFF - CH-47C 245 KPM

CH I NOUK

			11 ¥	AIK SPEED	D IN KTS	15		
	-	40	09	98	100	120	140	160
5 ¥ ¥ O	5.0	51	4.6	117	230	404	782	1164
2	100	67	66	234	450	748	1560	3365
SWUARE FEET	150	<b>†</b> †	148	352	069	1334	2339	348/
	700	65	198	694	930	930 1825	3118	4647

**TABLE** 5-34

the state of the second of

CURRECTION FUEL FLOW LBS/HK FUR EXTERNAL UKAG PRESSURE: 400L FT TEMPERATURE: "5 C AIRCRAFT ... CH...47C 245 KPH

CHIMOOK

,	•		XIV	AIR SPEED IN KIS	×	S		
						-		
		740	79	09	001	071	20 RO 100 170 140 190	
						2.5	700	775
	20	7	9+	103	613	) ``	109 213 3/0 034 1001	1001
O A A G					95	ı	9017 575 777	
	901	17	24	72 218 720	071		-000	
Z						,	0000	47.75
•	250	-	138	378	719	0	275 2107 0111 749	26.0
TARE SEATOR							4	7777
	202	95	¥ # # # # # # # # # # # # # # # # # # #	438	ς 2) (	1001	167 1001 /69	

TABLE 5-35

TO THE PROPERTY OF THE PROPERT

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL URAGE PRESSURE: 4000 FT TEMPERATURE: 15 C AINCRAFT = CH=47C 245 RPM

			14	R SPEE	AIR SPEED IN KTS	2		
		04	09	90	100	120	140	100
	50	13	43	103	200	347	589	986
9	100	97	98	206	104	969	1175	2002
2	150	34	130	308	603	1050	1862	3027
SECANE TERM	200	25	173	411	1	1426	803 1426 2545	404/

TABLE 5-36

CORRECTION FUEL FLOW LBS/HK FUR EXTERNAL URAU Pressure: 4000 ft temperature: 35 c

AIRCHAFI . CH.47C 245 KPM

CHINOOK

	•		X	SPEE	AIR SPEED IN KTS	S.		
			•					1
		40	90	9	100	120	140	100 120 140
			1			,		-
	6.	1.2	41	86	190 327	327	179	0.20
	<b>2</b>	4			١		0 / 3	CIAI COTO
2 4 X Q	100	4.7	82	195	379	0 U	0001	
•	)					0	667.	1116
Ζ,	150	36	122	242	569	187	187 101	
	) 1						0 1 6 %	37.37
SUVAKE FEET	200	64	49 163	388	758	6761	107	758 1363 431
	) ) 1							

TABLE 5-37

CURRECTION FUEL FLOW LBS/HK FOR EXTERNAL DRAG PRESSURE: 6000 FT TEMPERATURE: -25 C AIRCRAFT - CM-47C 245 KPM

CH I NOUK

			ALK	SPEED	AIR SPEED IN KTS	27		
		40		90	80 100 120	120	140 140	1,41
DRAG	90	14	46	109	217	386	386 720 1070	1070
N I	100	27	92	218	426	823	1443	215/
SAUARE FEET	150	1 5	138	327	949	1280	1280 2165 3235	3235
	700	45	h 8 1	436	877	1735	1735 2888	4313

TABLE 5-38

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL URAS PRESSURE: 6000 FT TEMPERATURE: -5 C

AIRCHAFT - CH-47C 245 RPM

			AIR	SPEED	AIR SPEED IN KTS	s		
		40	09	9	60 80 100 120 140 16U	120	140	160
	50	13	43	101	43 101 199	944	344 624	1000
2 X X Z	100	25	98	203	398	701	101 1301 2019	9107
ž :	150	38	38 129 305	305	597	601	F70E 9261 F601	3023
SQUAKE FEET	700	15	51 172 407	1	000 1521 2651 4030	1751	2651	4030

TABLE 5-39

CORRELTION FUEL FLOW LBS/HK FOR EXTERNAL UKAG FRESSURE: 6000 FT TEMPERATUKE: 15 C AIRCRAFT = CH=47C 245 KPM

CHINDUK

			ASA	SPEE	AIR SPEED IN KIS	15		
		40	9	80	201			L
1	2		1			07.	0 1	- - -
DARO	OC.	12	40	9.5	186	322	200	
	100	7.					270	0.5.0
2			•	061	373	249	1135	2 3
	150	36	- 2					• 4 0 4
LEGI LEGI			12.1	987	559	983	69/1	14.1
	700	4	141	33,	т			
		)	-	785	747	-		

TABLE 5-40

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL DRAG

PRESSURE: 6000 FT TENPERATURE: 35 C

AIRCHAFT - CH-47C 245 RPM

			AIR	SPEEU	AIR SPEED IN KTS	0		
•		40	09	90	100 120 140 160	120	140	100
× × ×	50	1.1	38	9.0	175	304 467	487	448
9 C 2 C .	100	27	7.6	179	351	909	1009 1736	9571
Z	150	45	+	269	527	916	918 1605 262 <sup>8</sup>	9792
SOUAKE PERT	200	45 152	152	359	703 1243 2203 3520	1243	2203	35.20

TABLE 5-41

CORRECTION FULL FLOW LBS/HR FOR EATERNAL URAG

PRESSURE: 8000 FT TEMPERATURE: -25 C

AIRCKAFF - CH-47C 245 KPM

	•		¥1 V	SPEED	AIR SPEED IN KTS	s.		
		40	09	80	80 100 120 140 16U	120	0 + 1	100
	90	13	42	101	101 198	380	380 670	444
.9	100	4.5	85	202	10+	804	804 1339 1947	1944
٠ ا	150	38	38 :27 303		614 1226 2609 2948	1226	2009	2978
SQUAKE FEET	907	15	51 170 405	405	844 1648 2678 39YO	8691	2678	3940

TABLE 5-42

COHRECTION FUEL FLOW LUSZHK FOR EATERNAL URAGE PRESSURE: BOGO FT TEMPERATURE: -5 C AIRCRAFT - CM-47C 245 HPM

¥
Э
2
z
$\bar{\mathbf{I}}$
ū
_

			AIR	SPEED	AIR SPEED IN KTS	5		
		94	09	0,9	100 120	120	077	1 40
						2		20
OK YO	5.0	12	40	9.5	184	324	416 219	410
	001	7.5	l					
z ,	3	4.7	00	189	368	699	1240	1860
	בת	, ,						
SAUARE FEET	200	20 117	411	283	557	1063	1856	2801
	7,05	-		l				
	20-	30 r		377	750 1454	1454	71 12 6040	37.45
		-						

TABLE 5-43

CURRECTION FUEL FLOW LBS/HR FOR EATERNAL DRAG

PRESSURE: BOOD FT TEMPERATURE: 15 C

AIRCRAFT - CH-47C 245 RPH

CHINOUK

	<b></b>		AIA	SPEED	AIR SPEED IN KIS			
						0.7	077	200
		17	09	08	100	170	171 001 08 09 175	
٠								
		-	37	(C	173	299	89 173 299 510 0/2	
	200	•						177
DRAG		2.2	75	177	346	607	22 75 177 346 607 1105 175	6/1
	201	7 7						
Z		3.3	112	266	520	938	1692	33 112 266 520 938 1692 262
	051	2					1	400
SHUARE FEFT	000	45	149	354	269	1311	45 149 354 697 1311 2277 3505	3302
	202							

TABLE 5-44

CORRECTION FULL FLOW LBS/HK FOR EATERWAL URAGE PRESSURE: 8000 FT TEMPERATURE: 35 C

AIRCHAFF . CH-47C 245 KPH

CHINOOK

			A 1.K	SPEEL	AIR SPEED IN KTS	S		
		40	09	08	60 100 120 140	120	0 + 1	100
DRAG	0.5	10	35	<b>59</b>	691 48	182	894	978
2.4	100	17	17	167	326	268	1005 1655	1655
SHUARE FEET	150	32	901	251	686	198	1558	7867
	700	42	141	334	334 654 1194 2112 3307	1194	2112	3307

**TABLE 5-45** 

CORRECTION FULL FLOW LBS/HK FOR EXTERNAL URAGE PRESSURE: 10000 FT TEMPERATURE: -25 C AIRCRAFT - CH-47C 245 HPM

CHINOOR

			AIR	SPEEU	AIR SPEED IN KTS	:Si	
		40	09	9.0	100	120	140
Dock	20	12	40	63	481	168	620
2 2	100	57	90	168	187	778	1240
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	150	37	120	482	603	1168	1859
	700	9.0	160	39!	437	1558	2479

185U 2776

3701

100

**TABLE 5-46** 

CORRECTION FUEL FLUW LBS/HM FOR EXTERNAL URAGE PRESSURE; 10000 FT TEMPERATURE; -5 C AIS NPM

			AIA	SPEE	AIR SPEED IN KTS	15		
		0 h	09	ยล	100		120 140	100
DRAG	20	11	37	19	171	314	581	864
٤	001	٤٦	14	174	242	029	670 1160	6711
SWUARE FEFT	150	ьs	111	292	528		1035 1739	2573
	007	9 h	8+1	351		1400	721 1400 2318 345	3450

TABLE 5-47

CORFECT!ON FUEL FLOW LBS/HH FOR EXTERNAL URAGE PRESSURE: 10000 FT TEMPERATURE: 15 C

AIRCHAFT - CH+47C 245 KPM

CILNCC

			AIR	AIR SPEED IN KTS	Y NT C	5.1		
		0,	09	90	100	120	120 140	26.5
DKAG	8.0	11	35	82	160	286	536	
2.	100	4.2	69	164	121	592	1080	1623
SUUARE FEET	150	32	104	246	487	937	1624	2435
	700	43	661	328	658	1277	2168 324/	3241

TABLE 5-48

CORRECTION FUEL FLOW LBS/HR FOR EXTERNAL CRAG Pressure: 1000C ft temperature: 35 c aircraft \_ CH-47C 245 RPM

			A 1 F	SPEE	AIR SPEED IN KTS	15		
		40	09	8.0	100	100 120	140	100
			1	1	1	2,1,	100	145
4	20	<u> </u>	77	``	161	007	4 %	
9 :	100	07	99	154	302	545	1005	1531
Z.	150	17	86	232	456	854	854 1517 2290	2290
SWUARE FEET	00%	. 3	131	309	614	1180	614 1180 2030 3064	3064

GROUND IDLE FUEL FLOW DATA

TABLE

TABLE 5-49

GRUUND JULE FUEL FLOW AIRCRAFT - CH-47C CHINDOR

			PRI.SSL	PRESSURE ALTITUDE (FT)	'UE (FT)		
		SEA LEVEL	2000	4000	6000	Ross	1 600.00
4 THE VALUE OF	-25 C	1480	1406	1280	1188	1103	10101
**************************************	) S=	1468	1368	1768	1176	1074	2 2 2
	15 C	1454	1374	1254	1162	10/6	701
	3 SE	1440	1360	1240	1148	1004	1000

ENIHIES ARE AIRCRAFT FUEL FIUW RATES IN LUS/HR

GROSS WEIGHT LIMITS DATA

TABLES
(245 RPM)

PRECEDING PAGE BLANK

TABLE 5-50

UNDS WEIGH! LIMITS
(UUE TO ENGINE)
FUR TAKEUFF CRITERIA #1
100% UF MAXIMUM POWER (HUGE)
AIRCRAFT - CH-47C 245 RPM
CHINOOR

			PRES	PRESSURE ALTITUDE (+T)	100E (+1)		
		SEA LEVEL	2000	7094	9000	8060	10000
TEMPEKATURE	-25 C	16465	56757	52912	48952	45261	41916
DEGREES	ວ <b>⊆</b> −	56570	53172	48993	4542B	42000	38876
	15 C	52434	48807	45302	42050	38420	36072
	35 C	h6#8h	45181	41937	38897	36014	33219

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GROSS WEIGHT LINIT: 46,000 LBS

100% OF MAXINUM POWER (HUGE) 245 KPM FOR TAKEOFF CRITCHIA #1 (DUE TO TRANSMISSION) GRUSS WEIGHT LIMITS AIRCRAFI - CH-47C CHINOUR

1	_				7	
		10000	46368	41143	40103	. 0.5
	E CONTRACTOR OF THE CONTRACTOR	2005	61661	12531	41240	40259
PRESSURE ALTITUDE (ET.)	6000	44587	43484	434.	21.77	59511
SURE ALTI	4000	45016	44545	43525	425.32	
PRES	2000	46627	45567	44569	43621	
	JEN LEVEL	44561		45500	64944	
3	3	J				
	-25	5-	115	J. J.E.		
	TEMPERATURE	DEGMEES		TEN I GRADE		
L.	_				i	

ENTRIES ARE AIRCHAFT GROSS WEIGHTS IN LBS

40254

STRUCTURAL GRUSS WEIGHT LIMIT: 46,000 LBS

THE PROPERTY OF THE PROPERTY O

GRUSS WEIGHT LIMITS

IDUE TO ENGINE!

FOR TAKEOFF CHITEHIA #2

YSA OF RATEU POWER" VENTICAL HATE OF CLIMB 450 FIJMIN.

0 5

AIRCHAFT - CH-47C 245 RPM

CHINDOK

			PRES	PRESSURE ALTITUDE (FT	TUDE (FT)		
		SEA LEVEL	2000	4000	60ün	იიმფ	10000
	-25 C	55693	52779	49.23	45525	42002	384/3
TEMPEKATOKE	) <b>}-</b>	52545	46474	45554	42236	39105	30157
DEGREES	15 C	48715	45350	42090	3907	3617/	33460
CENTIGRADE	35 C	45016	41947	38934	36110	33430	30848

ENTRIES ARE AIRCHAFT GRUSS WEIGHTS IN LBS

STRUCTURAL GRUSS WEIGHT LIMIT: 46.000 LBS

GROSS WEIGHT LIMITS

(DUE TO TRANSMISSION)

FOR TAREOFF CRITERIA #2

THANSHISSION PUWER LIMIT. VERTICAL HATE OF CLINB 450 FT/MIN.

AIRCKAFT - CH-47C 245 HPM

			PRFA	PRESSURE ALTITUDE (ET)	1006 (51)		
		SEA LEVEL	2000	4000	იიი9	9009	ופווטו
Action Control	-25 C	45323	44542	43669	42743	41800	44/04
THO AKAMEN	ນ <b>ຮ</b> ະ	06444	43627	42711	41774	40766	91/48
	15 C	43639	42735	41809	40841	39805	97/98
	35 C	42807	<b>5681</b> 5	h+60+	39927	38871	3/835

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GHOSS WEIGHT LIMIT: 46,000 LBS

TABLE 5-54

GRUSS WEIGHT LIMITS

(DUE TO ENGINE)

FOR TAKEOFF CHITERIA #3

100% OF MAXIMUM POWEK (HIGE) AIRCHAFT - CH-47C 245 HPM

			PRES	PRESSURE ALTITUDE (FT)	TUDE (FT)		
		SEA LEVEL	2005	4000	სეე9	0,008	10000
TEMPEKATURE	7 98-	67234	63633	59328	54843	14/05	14604
DEGREES	ን ዓ=	63405	10965	54715	4160G	94124	43573
CENTIGRADE	15 C	19285	54697	50768	47124	43657	46300
	) <b>9</b> €	14841	50630	46694	43588	40354	37.7.1

ENTRIES ARE AIRCRAFT GHOSS WEIGHTS IN LBS

STRUCTURAL GRUSS "LIGHT LIMIT: 46,000 LBS

GRUDS WEIGHT LIMITS

LUUL TO THANSHISSION) FOR TAKEOFF CHITERIA #3 JUGS OF NAXIMUM POWER (HIGE)

AIRCHAFT - CH-4/C 245 RPM

			PKES	PRESSURE ALTITUDE (FT)	TUDE (FT)		
		SEA LEVEL	2000	4000	6000	8630	1,000
TEMPERATURE	-25 C	79889	52307	54115	49957	48740	47469
DEGREES	) S-	96779	51087	9166h	48721	60474	84194
CERT IGRADE	7 51	51102	14664	48/70	47531	C+79h	h/644
	35 ८	ясппс	48879	47663	46395	4515/	438/3

ENTRIES ARE AIRCRAFT GROSS WEIGHTS IN LBS

STRUCTURAL GRUSS "ELGHT LINIT: 46:000 LBS

VELOCITY LIMITS DATA

TABLES
(245 RPM)

TABLE 5-56

VELUCITY LIMITS TABLE
(INCLUUING FUEL FLUM KATES)
PHESSURE: SEA LEVEL TEMPERATURE: -25 (
AIRCRAFT - CH-47C 245 RPM

CHINOOK

	·	<del></del>	<b></b>			
VELUCITY NEVER	(KTS) (LBS/HR)		57,3	44.44	1105	2063
VELOC	(A E S		491	150	135	120
TRANSMISSION Limils	(KFS) (LBS/AK) (KFS) (LBS/AK)		3376	3376	3376	3376
TRAN:	(KFS)		134	132	130	128
MAX POWER (ENGINE)	(LBS/HK)		4666	4666	4666	4994
(ENG	(KFS)		154	152	150	148
POWER POWER	(KFS) (LBS/AR)		4526	4526	4526	4526
7 - NO D	(KTS)		152	150	149	147
Long Range	(KFS) (LBS/AR)		2654	5917	2692	3055
<b>⊐</b> ∞	(KFS)		116	116	117	118
		GROSS AETGHTS (Las)	40.000	42.000	44.000	46.000

VELUCITY LINITS TABLE (INCLUDING FUEL FLUM KATES)

PALSOURE: SEA LEVEL TEMPERATURE: -5 C

AINCRAFT - CH-47C 245 RPM

CHINDOK

\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		1 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CONTINUCUS POAER	7 7 7 7 9	HAAA Pomek (engine)	1 X X X Y X X X X X X X X X X X X X X X	77420177103   18113   18113	4 E L U C 2	**************************************
STA)	(KTS) (L85/HK)	VEL ( K T S )	F.F.	(KTS)	KTS) (LBS/HR)	1	(KTS) (165/AK)	( £ T S J	(KTS) (LBS/HR)
46.4003 46.16015 (180.1									
40.000	2676	157	4050	163	1844	145	3442	165	1261
42.000 124	2757	155	4050	191	1881	143	34,42	097	3779
44,000	2911	153	4650	165	185	141	3442	135	3216
46.000 126	3020	151	40.50	158	1844	138	3445	120	7650

TABLE 5-58

VELUCIII LIMITS 140LE
(INCLUJING FÜEL FLÜR KATES)
PRESJURE: SEA LEVEL TEMPERATÜRE: 15 C
AIRCRAFT - CH-47C 245 RPM

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	-41	R PURSE	2 2 2 2 2 2 2	SUDUST TENDO	5. (3) (3) (4) (4)	2	TRAN	TRANDAISCION LIMITS	ייין ייין	**************************************
	(KT\$)	(*15) (L85/HK)	(KTS)	F.F. (LES/HR)	(£1%)	VEL (FFFR)	VEL (XTS)	VEL For	VEL	VEL (++++)
64035 4616415										
10.000	135	£5,97	155	3574	691	4233	153	34.07	591	, J
42,690	134	7067	153	3574	107	4233	151	3507	051	7
44.500	133	7967	150	3574	591	4233	149	3507	135	30.63
46.000	133	3066	14.8	3574	162	4233	146	3507	120	1212

TABLE 5-59

VELUCITY LINITS TABLE (INCLUDING FUEL FLOW MATES)

PRESSURE: SEA LEVEL TEMPERATURE: 35 C

AIRCRAFT - CH-47C 245 RPM

CHINCOK

	-JX	FONGE	COUT	HAX HINUUS POMEX	LENG	PONEX FOUND	TRAN	TRANSH15410N LIN115	, r L C	יברטרון אניהא בארבני
	(xES;	(KTS) (183/HA)	XEL (X75)	(L857.4R)	(415)	(KFS) (-85/AR)		(KTS) (Lac/HK)	(KT3)	(KTS) (LOS/AR)
2KU03 2KI6HIS										
		2 3014	147	3123	1/2	9104	160	3570	160	4555
40.000	3)					416	651	3570	145	2110
72.000	<b>3</b>	3018	143	3163	2	3				1897
000.4	142	3130	641	3123	167	4016	150	35/0	130	
0000	1 47		142	3123	1 00	4016	154	3570	115	9/07

TABLE 5-60

VELUCITY LIMITS TABLE TINCLUDING FUEL FLUM KATES)

PRESSURE: ZOND FT TEMPERATURE: -ZS C

AIRCHAFT \_ CH\_47C 245 RPM

CHINOOK

	, ארר ארר	LUNG	CONTINAX	CONTINUOUS POWER	EO'S	POTAK POWER (ENGINE)	TKANS	TKAN5015510N LIMITS	veroci	VELOLII NEVEK EACEEU
	(KFS)	KES (LBS/HR)	(KFS)	LBS/AR)		(KIS) (LBS/HR)	(KFS)	(KFS) (LBC/HK)	(KTS)	(XFS) (LBS/AR)
42 16H 5										
40,000	117	2632	150	4282	152	4458	135	3329	165	ن تود
42.000	118	2766	143	4282	150	4458	133	3369	150	ा एम
44.600	119	2900	146	4282	148	4456	130	3329	135	3558
46.600	120	304,	144	7876	146	4458	127	3329	120	304ë

TABLE 5-61

VELUCITY LIMITS TABLE INCLUDING FUEL FLUW KATES)

PHESSURE: 2000 FT TEMPERATURE: "5 C

AINCRAFT - CH-47C 245 RP"

CHINDOK

	795	RONGE	CONTI	SUDGE	EON	Z 0 0 N N N N N N N N N N N N N N N N N	TKAN2	TRANSHISSION LIMITS	*ELOC1	*ELUCIIY NEVEK
	2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	KET FOF BOAR	(K = 5)	L F.F. K	( KFS )	, HR )	(KFE)	(KTS) (LBS/AH)	(KTS)	(kTS) (LUS/Hn)
3										
(597)				. 010	143	4274	1 46	386	145	4465
40.000	124	1097	124	3/76				0.0	3 7 .	8/95
42.000	126	7766	152	3792	159	4544	144	3370	30.1	
44.000	126	2878	150	3792	157	4244	141	2390	135	
46.000	127	2996	147	3792	155	155 4244	136	3350	120	4087

TABLE 5-62

VELUCITY LIMITS TABLE

(INCLUDING FUEL FLOW KATES)

PPESSURE: 2000 F1 TEMPERATURE: 15 C

ATRCKAFT - CH-47C 245 RPM

CHINCOK

۲ ۲	์ ที่หว่		-		26	25
VELUCIIT NEVER EACEEU	(KFS) (Las/Hin)		1695	315.0	7,86	2025
VEL UC	(KFS)		157	771	129	114
TRANSMISSION	(LBC/HK)	:	3450	3450	3450	3450
TRAN	(×55)		155	751	150	147
MAK POWER (ENGINE)	(XES) (LBS/11R) (XES) (LBS/HR) (XES) (LBS/HR)		3948	3648	3948	3948
PCENE	(KFS)		191	163	101	851
CONTINUOS POWER	(L64/11R)		3347	3347	3347	3347
CON 1 1	(KTS)		152	150	147	144
LONG	YES) (LAS/AK)		27.36	2620	1067	3067
7.8	, VE )		134	133	133	135
		64055 *E16415 (LBD)	40.00U	22,000	44,000	000.64

TABLE 5-63

(INCLUDING FUEL FLOW KATES) VELUCITY LIMITS TABLE

TEMPERATURE: 35 245 RPM PRESSURE: 2000 FT

AINCHAFT - CH-47C

CHINDOK

	x	LONG	CONTL	CONTINUOUS POWER	EN P	PCER PCER (ENGINE)	TRAN	TRANSHISS 10N LIMITS	VELUCI	VELUCITY NEVER EACEEU
	(KEL)	VEL FOFTH	(KFS)	(KFS) (LBS/AR)	(KFS)	(KFS) (LBS/AR) (KFS) (LBS/AR)	(KTS)	ILBC/HK1	VEL (KTS)	(KTS) (LBS/AK)
GRUSS RETOHTS (Lbs)										
40.000	141	5882	127	58.58	169	3750	154	3510	154	3215
42.000	142	2973	141	67.67	991	3750	159	3510	139	4676
44.000	142	3068	139	2929	162	3750	156	9510	124	5007
46.000	143	3189	134	2929	159	3750	153	3510	10%	/097

TABLE 5-64

VELUCITY LINITS TABLE
(INCLUUING FUEL FLOW RATES)
SURE: 4010 FI TEMPERATURE: ~25 C

PHESSURE: 4000 FT TEMPERATURE: AIRCRAFT - CM-47C 24S RPM

CHINDOK

									•	Y 1	
	عد ا	7.0 X V V V V V V V V V V V V V V V V V V	CONTI	CONTINUOS	200 200 200 200 200 200 200 200 200 200	43-4 7 11-2 7 11-2 11-2 11-2 11-2 11-2 11-2 11-2 11-2	IHANS	IHANSHISSIUN LIMITS	vel061	vel0611- neve	
			O d						- L	•	
	1 4 7	F . F .	\ E.	00 00 00 00 00 00 00	(KE)	(XES) (LBS/AR) (XES) (LBS, AR)	(KF5)	ILGE, HE	(K75)	(KTS) (LUS/HR)	
	(KTS)	IKTSI (LBS/HR)	(K15)								
GRUSS											
*F16H15									3,	10, 10, 10,	
1,000					3	4112	136	3770	201		
40.000	118	2631	148	40.50			35.	17.7	150	4:11	
	1	2778	751	4020	148	4174	021			7. 4.	
42,000	120				. 45	4172	130	3290	135	2020	
4 4 5 61616	120	2915	143	4020				0865	120	1505	
	-	L	1	4620	142	4172	17,	1			
46,000	120	\r05									

TABLE 5-65

VELOCITY LIMITS IABLE

LINCLUDING FUEL FLOW RATES!

TEMPERATURE:

245 RFM AIHCKAFT - CH-47C PRESSURE: 4000 FT

CH I NOOK

						L				3
	الله الله	NO NO	2 - CO 2	NA E LANGUS	EO	POS POS PER	TRANS	TRANSMISSION LIMITS	veroc1	VELUCIII NEVEN
	<b>.</b>		0	MER	2 2 3					
	VE.	130	: 	- 1	KK K S	(KES) (LBS/AR)	(KTS)	(KTS) (LucyAK)	(475)	(XTS) (LBS/HR)
	(KT5)	(LBS/HR)	_	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
SKONO										
34,67,0									3	3985
				7, 76	158	3901	147	3345	121	
40.000	. 26	5024	151	2266	-		777	5446	557	3335
	40.1	2739	148	3526	155	3701	-		3	1151
000 • 7 •,	231			14.74	152	3901	141	3345	12.	
44.000	127	2863	142	2350		1 20 6	45.	3345	114	6997
0000	86.1	2998	142	3526	150	3781				
000.00		١								

TABLE 5-06

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VELUCITY LIMITS TABLE
[INCLUDING FUEL FLOM KATES]
PRESSURE: 4000 FI TEMPERATURE: 15
AIRCRAFT - CH-47C 245 RPM

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	12	RONG BRG FE	CONT	CONTINUOUS POWE!	EP	MAX POW'R (ENGINE)	TRANS	TRAHSHISSION Limits	*******	VELUCITY NEVER EACEEU	
	(KTS)	(KFS) (LBS/#K)		(LBS/AR)	( X F E ,	ES (LBS/AR) (KES) (1 ASSA), VEL	VEL.	• 4• 4	VEL	4.4	
						Nii / Cami	(813)	1 LUC/HK)	(KT5)	(KTS) (LBS/HN)	-
"E   GM   S ( Lo  )											-
	-										
	133	2992	148	3116	162	3471	7				
	135	2810	7.77			1	150	3400	153	3643	_
Ī			113	3116	159	3671	153	7400	7	26.16	
14.000	135	2920	142	3116	156	1		3	201	60.73	
	135	3043			Т		001	0015	123	4635	
			851	3116	153	3671	751	0044	3	, , ,	
				•	•						

**TABLE 5-67** 

VELUCITY LIMITS TABLE
(IMCLUDING FUEL FLOW KATES)
PMESSURE: 4000 FT TEMPERATURE: 35 C
AIRCRAFT - CM-47C 245 RPM

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		<u> </u>		1		•				-
	VELUCITY NEVER		(KTS) (LBS/HR)			, , ,	7,00	4024	0157	4.
	VELUCI	1.57	1 K 7 5 1			1	047	131		T
	18ANS#15510N LIMITS	F. F.	(KTS) (LBC/HR)			3445	0.10	3455	3455	3455
	TRANS	VEL	(KTS)			161		157	:55	151
	MAX POWER (ENGINE)	0:	1LDS/HR)			3487	3447		3487	3487
	6 0Z	VEE.	10141			101	1,611		150	152
	ONTINUOUS POWER	15 F	N. C.			2724	27.29		67.67	2729
CONT		VE L					134	000	, 7,	120
	RANGE GE	(KIS) (LBS/HR)			24	100.	2916	3051		3158
	ĴΥ	VEL (KTS)			142		143	143		1+7
			GRUSS	relenfs (LBS)	40,000		42.000	44.000	44.000	000

TABLE 5-68

VELUCITY LIMITS TABLE

TEMPERATURE: "25 C LINCLUDING FUEL FLOW RATES)

245 RPM AIRCHAFT - CH-47C PRESSURE: 6000 Ff

CHINCOK

	1		(100/144)			-	159 4073	39.46	144	2676 963	6987			•	
The same of the sa	TRANSHIS' LON			(XTS)   LBC/HK)			1362	130	333 3262	+	129 3204	126 3262			
	H A A	100 DE 10		1, VFS (LBS/AR)				146   3662	╀	143 3864	140 3862	3862	13/		
	X	CONTINGOUS		4	(KTS) (LBS/HK)				144 3/58	3758	+	138 3/50	3758	+	
		2010			(KFS) (LBS/#R)		<del>ol</del>		2651		120 2782	1121 2917		121 3060	
	l					5500	SET OF JA	((0))		40,000	47.1100	000	44.000	46.000	

TABLE 5-69

VELUCITY LIMITS TABLE (INCLUDING FUEL FLOW HATES)

PRESSURE: 6000 FT TEMPERATURE: -

AIRCRAFT - CH-47C 245 RPM

CHINCOR

	RF A	LONGE	CONTINUOUS	A A A A A A A A A A A A A A A A A A A	E S C S E S E	AE XIIX XIIX	TRANS	TRANSH15510N L1H1TS	VELUCI	VELUCITY NEVER EACEEU
	( K E 5 )	KES) (LBSFAR)	(KFS)	LBS/#R)	(255)	(KFS) (LBS/AR)	(KFS)	(KFS) Lacink	(KFS)	(KFS) (LOS/AK)
64000 6416415										
10.000	127	2604	147	3279	154	3624	147	3309	153	3588
42.000	127	2734	144	3279	151	3624	144	9055	138	
44.000	128	5/67	140	3279	147	3624	141	ı	123	
46,000	129	3021	136	3279	144	3624	137	3309	108	1657

TABLE 5-70

VELUCITY LIMITS TABLE
(INCLUDING FUEL FLOW RATES)
PHESSURE: 6500 FI TEMPERATURE: 15 C
AIRCRAFT - CH.47C 245 RPM

CHINDOK

	ŢX.	LONG	CONT	CONTINUOUS PUNER PUNER	F 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	CENCINE)	TRAN	TRANSHISSION Limits	VELOC	VELOCITY REVER
	(KFS)	(KFS) (LBS/AK)	(KFS)	ונבפלר ונללבן ונבפלרה וגלל ונבליחו	(XFS)	(LB\$/#R)	( 445)	したしことがはり	(KES)	(KFS) (L63/AK)
6HU35 *£16HTS (L65)							•			
40.000	135	2662	143	7697	158	3415	157	3358	14/	30.21
47.000	135	2700	139	6.7.2	154	3415	153	4356	128	0197
44.000	135	2910	134	7 77	150	3415	641	3358	108	4453
46.000	136	3117	127	2896	145	3415	143	3356	8 64	4947

TABLE 5-71

VELUCITY LIMITS TABLE (INCLUDING FUEL FLOW RATES) PRESSURE: 6000 FT TEMPERATURE: 35 C

AINCRAFT - CH-47C 245 RPM

CHINOOK

VELOTITY NEVER	EXCEEU	(KFS) (Lassinn)			7357	140	P467 001	1040	0.5	<b>)</b>	
2000	LIBITS CO	(LBC/HR)				7040	3407		3407	3407	*
	A A L	(KFF)				162	871		152	377	
-	WER VER	(NFS) (LBS/HR) (KFS) (LBS/HR)				3240	3240	27.	3240	2000	22.70
-	DOMER POWER (ENGINE)	(KFS)				158	77 3 .	16:	147		24.0
	SAX DINUOUS PIEER	K. L. H. F. F. HR.				2536		25.30	2536		2536
	CONT	VEL.				133		122	011		C
<u> </u>	RANGE	VERT.	1 LOS/UN 1			2777		28/3	3050		3223
	7% 26	- E/I	18131			271	517	1 + 1		1 . 1	139
•				GACUS	(CA)	0000	000.01	42.000		44.000	46.000

TABLE 5-72

The second secon

VELUCITY LIMITS TABLE

(INCLUDING FUEL FLUR KATES)

PRESSURE: BURO FT TEMPERATURE: -25

AINCHAFT - CH.47C 245 RFM

CHINOOK

) (x   x   x   x   x   x   x   x   x   x	PUMER						
>X mp-		EP	MAK POWEK (ENGISE)	T R A R	TRANSHISGION LIMITS	VELUC	VELUCITY NEVER EACEEU
	5) (Las/198)	(X\$\$)	(KFS) (LBS/AR) (KFS) (LBS/AR)	(KFL)	ILBE/HR!	X EV	(XFS) (+as/Hn)
2650 140	3500	141	3574	136	3256	153	13%2
2790 136	3500	138	3574	132	3256	138	+1.50
2939 133	3 3500	134	3574	128	3256	123	3031
3092 12	3500	130	3574	124	3256	106	2768

TABLE 5-73

VELUCITY LIMITS TABLE IINCLULING FUEL FLON MATES OURE: BONG FI TEMPERATURE: -5 C

PHESSURE: BONG FI TEMPERATURE: TALESSURE: AIPCRAFT - CM-47C 245 RPM

CHINDOK

		<u></u>					JUN AND	NOISCIE	*****	*ELUCITY NEVEN	
7X 2X 2X 2X 2X	بر 22		CONTIN	SUOUNIT	7 D Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	7 LL X		STUTT	E A (	ו ניניה ו ניניה	
			Po					. 9 9	× F.	VEL FOR	
VEL FOR	le.		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	F F F F F F F F F F F F F F F F F F F	(KF5)	(XYS) (LBSTAR)	(K15)	(KTS) 1LBC/HK1	(KTS)	1 - B > / B A	
K 75) (La	ב ב	3/HK)	2								
											-
							-	0 7 7	977	3236	
				36.25	149	3362	/ 5 7	3207			1
128		2609	142	2013			7777	4/96	120	7000	<b>-</b> T
		2754	137	31,35	145	3362	<u> </u>	4		7468	
1.27	_	15/3			7 7 7	3362	139	3269	100		1
128		7900	133	3035		1	37	2040	90	7434	
+	1	1	101	30.35	135	3362	134	4	-	A	ľ
126		1 506	3.50		-						
	1										•

TABLE 5-74

TEMPEKATURE: (INCLUDING FUEL FLOW KATES) VELUCITY LIMITS TABLE AIHCHAFT - CH..47C Pressure: 8000 FT

CHINGOR

245 RPM

l								T		
VELUCITY NEVER		( - B > / B R )			3	4977	464		9	
VELUC	144 144 2	(413)				) ! !	16		2	
TRANSH15510N	7	1 UU / > 0 3 1			21.7	235/	3367	33.7	1357	
TRAN	VEE				156		151	24.5		
MAA POWER (ENGINE)	(KFS) (LBS/AR) (YFS) (FS/Ch.)				3170		2170	3170		- 0.1.
ENG	(XFS)				152		74.	140	†	
CONTINUOUS PCAER	FS) (LBS, AR)				2679	27.70	1/07	2679		6/97
7 1 10 2	( 18 18 )				136	1 36.	2	120		- vv-
LUNG KANGE	KFE) (LBS/AR)			1 1 1 2	2407	2682		9105	3775	
7%	(× F 5)			36.	135	961		135	134	
		6K055	, r (ed (5	40.000		42.600	44.000	000	46,000	

TABLE 5-75

VELOCITY LIMITS TABLE (INCLUDING FUEL FLUM RATES)

AIRCKAFT - CH-47C 245 RPM

TEMPERATURE:

PAESSURE: BUNG FT

CHINCOK

	738	LONG RANGE	C C M T T T T T T T T T T T T T T T T T	POSTER	FOR	MAX POWER (ENGINE)	1 A A Y A A A A A A A A A A A A A A A A	TPANSHISSION LIMITS	* F L U L L	VELUCATY NEVER EACEED
	(XFS)	KFS) (LBS/AR)	(KFE)	(KFS) (LBS/AR)	· <b>₹</b> \$,	(Kts) (185/88) (Kts) (180/84)	(KFS)	(LBc/HR)	(KF5)	(KFS) (LBS/AR)
*E16HTS										
40.000	1 4 1	2755	127	2347	150	3006	160	3369	89	4199
42.000	140	2940	95	2347	142	3006	154	3309	3	٥
44.000	171	3216	C.	2347	133	3006	146	3364	2	9
46.000	137	3381	C	2347	174	3006	137	9955	0	0

TABLE 5-76

VELOCIIY LIMITS TABLE (INCLUDING FUEL FLUM HATES) PRESSORE: 10000 FT TEMPERATURE: -25 C AIRCRAFT - CH, 47C 245 RPM

CHINOGE

		<del>v-</del>	,	r	<b></b>	
VELUCITY NEVER EACEEU	(* £ 5) (L= 5/An)		7446	3600	9497	4647
170774	(×£5)		140	120	106	98
TRANSPISELON LINITS	しんはこんがおり		1075	19/6	1975	1076
FRANS	(XFS)		135	151	126	120
MAK POWEK (ENGINE)	15) (เมื่อรักห) (หรีร) (เมื่อรักห) (หรีร) (เมื่อรักห)		136 3319	6158	1319	3319
)   66   1	(44%)		136	132	127	171
CONTINUOUS PUWER	(L84/#R)		3746	3240	3240	3240
CUNT	(XFF)		134	130	125	611
L UNG Range	(XFS) (LBS/AR)		2665	6197	2910	3070
-R	(×F5)		121	120	911	114
		4216715 4216715 (185)	40.400	000*75	44.000	46.000

TABLE 5-77

VELUCITY LIMITS FABLE
(INCLUDING FUEL FLOW MATES)
PHESSURE: 10:000 FT TEMPEKATURE: -5 C
ATHCHAFT - CH-47C 245 RPM

	14	H U.S.	CORT	SCOUT INCOUS	P OG E E E E E E E E E E E E E E E E E E	# # # # # # # # # # # # # # # # # # #	TRANS	TRANSSISSION Liniis	******	*ELUCITY RE*CF
			-							4
	V 4 1	VEL FOR	× (	VEL F.F.	(x [ S ]	(KES) LUSTAR	(* T.S.)	(KTS) (LBC/HR)	18751	1 KTS1 (LB5/HR)
	18131	15031								
2 2 2 2 3 2 3 2 3 2 3 2 3 2 3 3 3 3 3 3										
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TABLE 5-78

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TABLE 5-79

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APPENDIX A FUNCTIONS FOR CALCULATING BASIC FUEL FLOW

## 1. CH-47C Operating at 235 RPM

There are four functions that can be used to calculate the basic fuel flow for the CH-47B helicopter operating at 235 RPM. In order to use the functions the following data is needed:

- 1. Flight Mode
- 2. Temperature
- 3. Pressure (altitude)
- 4. Gross weight

Which of the four functions will be used depends on the flight mode. The first function is for HIGE (Hover In Ground Effect).

The second function is for HOGE (Hover Out of Ground Effect).

$$FF (HOGE) = f (TEMP, ALT, GW)$$

The third function is for NOE (Nap of the Earth).

$$FF(NOE) = f(TEMP, ALT, GW)$$

The fourth function is for Forward Flight.

The equation for FF (HIGE) is:

$$FF (HIGE) = A (ALT) + B (TEMP) + C (GW) + D (ALT)(TEMP)$$

$$+ E (ALT) (GW) + F (TEMP) (GW)$$

$$+ G (ALT) (TEMP) (GW) + K$$

Where ALT is the altitude, TEMP is the temperature and GW is the gross weight and the constants have the following values:

 $A = -4.18033488 \times 10^{-2}$   $E = 1.11825291 \times 10^{-6}$  B = 1.08751586  $F = 8.07031975 \times 10^{-5}$  $C = 5.33395773 \times 10^{-2}$   $G = 1.36606525 \times 10^{-8}$ 

 $D = -3.51402949 \times 10^{-4}$   $K = 4.84275543 \times 10^{2}$ 

The equation for FF (HOGE) is exactly the same form as FF (HIGE). A new set of values for the constants is used. These values are:

 $A = -5.88115812 \times 10^{-2}$ 

 $E = 1.93141847 \times 10^{-6}$ 

 $B = -8.84728134 \times 10^{-2}$ 

 $F = 1.38394884 \times 10^{-4}$ 

 $C = 6.1890916 \times 10^{-2}$ 

 $G = 1.60426457 \times 10^{-8}$ 

 $D = -3.78898469 \times 10^{-4}$ 

 $K = 4.17171783 \times 10^2$ 

The equation for FF (NOE) is once again the same as FF (HIGE). The new values for the constants are:

 $A = -6.06951821 \times 10^{-2}$ 

 $E = 1.82329043 \times 10^{-6}$ 

 $B = -7.06558749 \times 10^{-2}$ 

 $F = 1.16511314 \times 10^{-4}$ 

 $C = 5.2232069 \times 10^{-2}$ 

 $G = 1.72442876 \times 10^{-8}$ 

 $D = -4.1362632 \times 10^{-4}$ 

 $K = 5.56116821 \times 10^2$ 

For the Forward Flight modes the form of the equation is:

 $FF = A(AS) + B(AS^2) + C(AS^3) + D(TEMP) + E(GW) + F(ALT) + G(AS^3)(TEMP)$ 

+  $H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(GW) + K(AS^2)(GW)$ 

+ L(AS)(GW) + M(AS $^{3}$ )(ALT) + N(AS $^{2}$ )(ALT) + O(AS)(ALT) + P(TEMP)(GW)

+ Q(TEMP)(ALT) + R(GW)(ALT) + S(TEMP)(GW)(ALT) + T

Where AS is the air speed in kts and the values of the constants are:

 $A = -3.77404814 \times 10$ 

 $K = -1.8393742 \times 10^{-5}$ 

 $B = 4.24010076 \times 10^{-1}$ 

 $L = 1.12421578 \times 10^{-3}$ 

 $C = -1.01004529 \times 10^{-3}$ 

 $M = -1.37884145 \times 10^{-7}$ 

D = 1.03554213 X 10

 $N = 3.06267834 \times 10^{-5}$ 

 $E = 1.26485201 \times 10^{-2}$ 

 $0 = -2.34560855 \times 10^{-3}$ 

 $F = -2.29212269 \times 10^{-2}$ 

 $P = 3.11250682 \times 10^{-4}$ 

 $G = -3.12955658 \times 10^{-5}$ 

 $Q = 4.4806207 \times 10^{-4}$ 

 $H = 7.16897036 \times 10^{-3}$ 

 $R = 2.23874594 \times 10^{-6}$ 

 $I = -5.56602478 \times 10^{-1}$ 

 $S = -4.34590968 \times 10^{-8}$ 

 $J = 7.77223859 \times 10^{-8}$ 

 $T = 1.8023027 \times 10^3$ 

These functions allow anyone with a simple calculator to figure the fuel flow of the aircraft and bypass both looking up the values and interpolating for points in between the data points in the tables.

The above equations calculate the basic fuel flow for the CH-47C helicopter operating at 235 RPM with the following accuracies:

FF (HIGE) - 99.64%

FF (HOGE) - 99.33%

FF (NOE) - 98.19%

FF (Forward Flight) - 93.86%

### 2. CH-47C Operating at 245 RPM

There are four functions that can be used to calculate the basic fuel flow for the CH-47B helicopter operating at 245 RPM. In order to use the functions the following data is needed:

- 1. Flight Mode
- Temperature
- 3. Pressure (altitude)
- 4. Gross weight

Which of the four functions will be used depends on the flight mode. The first function is for HIGE (Hover In Ground Effect).

The second function is for HOGE (Hover Out of Ground Effect).

The third function is for NOE (Nap of the Earth).

The fourth function is for Forward Flight.

The equation for FF (HIGE) is:

$$FF$$
 (HIGE) = A (ALT) + B (TEMP) + C (GW) + D (ALT)(TEMP)  
+ E (ALT) (GW) + F (TEMP) (GW)  
+ G (ALT) (TEMP) (GW) + K

Where ALT is the altitude, TEMP is the temperature and GW is the gross weight and the constants have the following values:

$$D = -3.51416853 \times 10^{-4}$$
  $K = 3.89716461 \times 10^{2}$ 

The equation for FF (HOGE) is exactly the same form as FF (HIGE). A new set of values for the constants is used. These values are:

 $A = -2.29995189 \times 10^{-1}$ 

 $E = 6.22147991 \times 10^{-6}$ 

B = -5.28438944

 $F = 2.65626702 \times 10^{-4}$ 

 $C = 7.02132583 \times 10^{-2}$ 

 $6 = 2.42121925 \times 10^{-8}$ 

 $p = -7.11802662 \times 10^{-4}$ 

 $\kappa = 1.28996002 \times 10^2$ 

The equation for FF (NOE) is once again the same as FF (HIGE). The new values for the constants are:

 $A = -2.04558648 \times 10^{-1}$ 

 $E = 5.37683025 \times 10^{-6}$ 

B = -2.73703614

 $F = 1.7907843 \times 10^{-4}$ 

 $C = 6.0988307 \times 10^{-2}$ 

 $G = 4.52854692 \times 10^{-8}$ 

 $D = -1.5812756 \times 10^{-3}$ 

 $K = 2.78352539 \times 10^2$ 

For the Forward Flight modes the form of the equation is:

 $FF = A(AS) + B(AS^2) + C(AS^3) + D(TEMP) + E(GW) + F(ALT) + G(AS^3)(TEMP)$ 

+  $H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(GW) + K(AS^2)(GW)$ 

 $+ L(AS)(GW) + M(AS^3)(ALT) + N(AS^2)(ALT) + O(AS)(ALT) + P(TEMP)(GW)$ 

+ Q(TEMP)(ALT) + R(GW)(ALT) + S(TEMP)(GW)(ALT) + T

Where AS is the air speed in kts and the values of the constants are:

 $A = 1.4591177 \times 10$ 

 $K = 3.95673749 \times 10^{-6}$ 

 $B = -1.27493959 \times 10^{-1}$ 

 $L = -8.94904137 \times 10^{-4}$ 

 $C = 6.56571239 \times 10^{-4}$ 

 $M = -8.69541026 \times 10^{-8}$ 

D = 3.87899423

 $N = 2.29792088 \times 10^{-5}$ 

 $E = 8.85471553 \times 10^{-2}$ 

 $_{0} = -2.08567723 \times 10^{-3}$ 

 $F = 6.71030849 \times 10^{-3}$ 

 $P = 4.72741376 \times 10^{-5}$ 

 $G = -9.21962567 \times 10^{-6}$ 

 $Q = 1.11335551 \times 10^{-3}$ 

 $H = 4.26615639 \times 10^{-4}$ 

 $R = 1.22879437 \times 10^{-6}$ 

 $I = -1.24208927 \times 10^{-2}$ 

 $S = -3.21402496 \times 10^{-8}$ 

 $J = 4.83834617 \times 10^{-9}$ 

 $T = -3.04298401 \times 10^2$ 

These functions allow anyone with a simple calculator to figure the fuel flow of the aircraft and bypass both looking up the values and interpolating for points in between the data points in the tables.

The above equations calculate the basic fuel flow for the CH-47C helicopter operating at 245 RPM with the following accuracies:

FF (HIGE) - 98.26%

FF (HOGE) - 97.70%

FF (NOE) - 97.39%

FF (Forward Flight) - 98.17%

# APPENDIX B FUNCTIONS FOR CALCULATING DELTA FUEL FLOW FOR DRAG

# 1. CH-47C Operating at 235 RPM

The function below will calculate the delta fuel flow for drag for the CH-47 C helicopter operating at 235 RPM. Recall from the discussion in chapter three that this value is added to the basic fuel flow value whenever drag is increasing the rate of fuel flow."

In order to use the function the following data is needed:

- 1. Air Speed (AS)
- 2. Equivalent Square Footage of Drag (SQ)
- 3. Temperature (TEMP) in degrees centigrade
- 4. Altitude (ALT) in feet above sea level

That is:

$$FF$$
 (Drag) =  $f(AS, SQ, TEMP, ALT)$ 

The equation for FF (Drag) is:

$$FF (Drag) = A(AS) + B(AS^{2}) + C(AS^{3}) + D(TEMP) + E(SQ) + F(ALT)$$

$$+ G(AS^3)(TEMP) + H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(SQ) + K(AS^2)(SQ)$$

$$+ L(AS)(SQ) + M(AS^{3})(ALT) + N(AS^{2})(ALT) + O(AS)(ALT) + P(TEMP)(SQ)$$

+ 
$$Q(TEMP)(ALT) + R(SQ)(ALT) + S(SQ)(ALT)(TEMP) + T$$

Where the constants have the following values:

$$A = 1.92351666$$
  $K = -1.84985049 \times 10^{-3}$ 

$$B = -1.58761502 \times 10^{-2}$$
 L = 1.34020805 x 10<sup>-1</sup>

$$C = 1.22072934 \times 10^{-4}$$
  $M = -3.96785356 \times 10^{-8}$ 

$$D = 6.74994808$$
  $N = 5.21734358 \times 10^{-6}$ 

$$E = -1.57020617$$
  $0 = -4.03765589 \times 10^{-4}$ 

$$F = 4.01374176 \times 10^{-2}$$
  $P = -3.25795538 \times 10^{-2}$ 

$$G = -1.169635 \times 10^{-5}$$
  $O = -1.83679713 \times 10^{-5}$ 

$$H = 2.24108415 \times 10^{-3}$$
  $R = -2.4964305 \times 10^{-4}$ 

$$I = -1.54114246 \times 10^{-1}$$
  $S = 1.04480392 \times 10^{-6}$ 

$$J = 1.2006097 \times 10^{-5}$$
  $T = -2.27549515 \times 10^{2}$ 

<sup>\*</sup>There is no delta fuel flow for drag for HIGE, HOGE or NOE flight

This equation calculates the delta fuel flow for drag value with an accuracy of 99.56%. It should be noted that in some instances the computed value will be negative. If this occurs, zero ( $\emptyset$ ) should be used as the value for delta fuel flow.

### CH-47C Operating at 245 RPM

The function below will calculate the delta fuel flow for drag for the CH-47C helicopter operating at 245 RPM. Recall from the discussion in chapter three that this value is added to the basic fuel flow value whenever drag is increasing the rate of fuel flow.\*

In order to use the function the following data is needed:

- 1. Air Speed (AS)
- 2. Equivalent Square Footage of Drag (SQ)
- 3. Temperature (TEMP) in degrees centigrade
- 4. Altitude (ALT) in feet above sea level

#### That is:

$$FF (Drag) = f(AS, SQ, TEMP, ALT)$$

The equation for FF (Drag) is:

$$FF (Drag) = A(AS) + B(AS^{2}) + C(AS^{3}) + D(TEMP) + E(SQ) + F(ALT)$$

$$+ G(AS^3)(TEMP) + H(AS^2)(TEMP) + I(AS)(TEMP) + J(AS^3)(SQ) + K(AS^2)(SQ)$$

$$+ L(AS)(SQ) + M(AS^{3})(ALT) + N(AS^{2})(ALT) + O(AS)(ALT) + P(TEMP)(SQ)$$

+ 
$$Q(TEMP)(ALT) + R(SQ)(ALT) + S(SQ)(ALT)(TEMP) + T$$

Where the constants have the following values:

$$I = 2.72080421 \times 10^{-1}$$

$$J = 6.97609534 \times 10^{-6}$$

$$Q = 3.00417855 \times 10^{-5}$$

$$R = -2.39477551 \times 10^{-4}$$

$$S = 1.2046344 \times 10^{-6}$$

$$T = -5.04253357 \times 10^2$$

 $H = -3.03890294 \times 10^{-3}$ 

<sup>\*</sup>There is no delta fuel flow for drag for HIGE, HOGE or NOE flight.

This equation calculates the delta fuel flow for drag value with an accuracy of 99.59%. It should be noted that in some instances the computed value will be negative. If this occurs, zero ( $\emptyset$ ) should be used as the value for delta fuel flow.

# APPENDIX C

FUNCTION FOR CALCULATING GROUND IDLE FUEL FLOW

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The function below will calculate the ground idle fuel flow rate for the CH-470 helicopter. In order to use the function the following data is needed:

- 1. Temperature (TEMP) in degrees centigrade.
- 2. Altitude (ALT) in feet above sea level.

That is:

The equation, for FF (Idle) is:

FF (Idle) = 
$$A(TEMP) + B(ALT) + C(TEMP)(ALT) + D(TEMP2) + E(ALT2) + F$$

Where the constants have the following values:

$$A = -6.5749985 \times 10^{-1}$$
  $D = -1.24999922 \times 10^{-3}$ 

$$B = -5.5428531 \times 10^{-2}$$
 E = 9.99996317 x 10<sup>-7</sup>

$$C = -3.00133252 \times 10^{-11}$$
 F = 1.47358652 x 10<sup>3</sup>

This equation calculates the ground idle fuel flow rate with an accuracy of 99.67%.

# APPENDIX D

FUNCTIONS FOR CALCULATING GROSS WEIGHT LIMITS FOR TAKEOFF

# 1. CH-47C Operating at 235 RPM

The functions given below will calculate the gross weight limits for take off for the CH-47<sup>C</sup> helicopter operating at 235 RPM. Each of the functions is of the same basic form with the values of the constants changing depending on which take off criteria is being used. In all cases the Structural Gross Weight Limit of the CH-47<sup>C</sup> helicopter is 46,00<sup>C</sup> lbs.

In order to use the functions the following data is needed:

- 1. Temperature (TEMP) in degrees centigrade
- 2. Altitude (ALT) in feet above sea level

That is:

The basic equation for GW (Limit) is:

$$GW (Limit) = A(TEMP) + B(ALT) + C(TEMP)(ALT) + D$$

For take off criteria #1 the equation must be used twice, once using the engine limit constants and once using the transmission limit constants. For take off criteria #1 the constants for engine limits are:

$$A = -2.04521187 \times 10^2$$

$$C = 6.45157177 \times 10^{-3}$$

$$B = -1.73651493$$

$$D = 5.48574741 \times 10^4$$

For take off criteria #1 the constants for transmission limits are:

$$A = -5.41285706 \times 10$$

$$C = -2.38285902 \times 10^{-4}$$

$$B = -5.78837119 \times 10^{-1}$$

$$D = 4.65754517 \times 10^4$$

For take off criteria #2 two checks must also be made. The constants for engine limits, take off criteria #2 are:

$$A = -1.91924759 \times 10^2$$

$$C = 6.05328596 \times 10^{-3}$$

$$B = -1.62188777$$

$$D = 5.1224647 \times 10^4$$

For take off criteria #2 the constants for transmission limits are:

$$A = -4.7751194 \times 10$$

$$C = -4.11927958 \times 10^{-4}$$

$$B = -5.19843929 \times 10^{-1}$$

$$D = 4.46686484 \times 10^4$$

Also for take off criteria #3 two checks must be made. The constants for engine limits, take off criteria #3 are:

 $A = -2.30310486 \times 10^{2}$ 

 $C = 7.26843113 \times 10^{-3}$ 

B = -1.94757777

 $D = 6.15208135 \times 10^4$ 

For take off criteria #3 the constants for transmission limits are:

 $A = -6.06521425 \times 10^{3}$ 

 $C = -3.0357156 \times 10^{-4}$ 

 $B = -6.45660669 \times 10^{-1}$ 

 $D = 5.21943193 \times 10^4$ 

This equation with the various sets of constants gives results that are 99.89% accurate or better.

## 2. CH-4/C Operating at 245 RPM

The functions given below will calculate the gross weight limits for take off for the CH-47C helicopter operating at 245 RPM. Each of the functions is of the same basic form with the values of the constants changing depending on which take off criteria is being used. In all cases the Structural Gross Weight Limit of the CH-47C helicopter is 46,000 lbs.

In order to use the functions the following data is needed:

- 1. Temperature (TEMP) in degrees centigrade
- 2. Altitude (ALT) in feet above sea level

That is:

The basic equation for GW (Limit) is:

$$GW (Limit) = A(TEMP) + B(ALT) + C(TEMP)(ALT) + D$$

For take off criteria #1 the equation must be used twice, once using the engine limit constants and once using the transmission limit constants. For take off criteria #1 the constants for engine limits are:

$$A = -2.00498346 \times 10^2$$

 $C = 5.51400252 \times 10^{-3}$ 

$$B = -1.72648424$$

 $D = 5.52583125 \times 10^4$ 

For take off criteria #1 the constants for transmission limits are:

$$A = -4.92673783 \times 10$$

 $C = -5.14857456 \times 10^{-4}$ 

$$B = -5.39397113 \times 10^{-1}$$

 $D = 4.64107769 \times 10^4$ 

For take off criteria #2 two checks must also be made. The constants for engine limits, take off criteria #2 are:

$$A = -1.87090488 \times 10^2$$

 $C = 5.07593085 \times 10^{-3}$ 

$$B = -1.60321172$$

 $D = 5.13487373 \times 10^4$ 

For take off criteria #2 the constants for transmission limits are:

$$A = -4.23669033 \times 10$$

$$C = -7.50785934 \times 10^{-4}$$

$$B = -4.76228192 \times 10^{-1}$$

 $D = 4.43537026 \times 10^4$ 

Also for take off criteria #3 two checks must be mude. The constants for engine limits, take off criteria #3 are:

 $A = -2.25033333 \times 10^2$ 

 $C = 6.16950123 \times 10^{-3}$ 

B = -1.93471529

 $D = 6.19340469 \times 10^4$ 

For take off criteria #3 the constants for transmission limits are:

 $A = -5.60299997 \times 10$ 

 $C = -4.62999953 \times 10^{-4}$ 

 $B = -6.05156399 \times 10^{-1}$ 

 $D = 5.20308398 \times 10^4$ 

This equation with the various sets of constants gives results that are 99.88% accurate or better.

# APPENDIX E SHORT DESCRIPTION OF CHINOOK (CH-47C) DATA SOURCE

DRDAV-EQA(A)

SUBJECT: Short Description of CH-47C Performance Data Provided to TRADOC

Systems Analysis Activity (TRASANA)

MFR:

#### 1. References:

- a. United Kingdom CH-47C, Hover-out-Grownd Effect (HOGE), Power Required (Boeing Vertol IOM 8-7442-1-439).
- b. Determination of the Effects of Rotor Blade Compressibility on the performance of the UH-1F; FTC-TR-65-17.
- c. Airworthiness and Flight Characteristics Test, CH-47C Helicopter (Chinook) USAASTA Project No. 66-29.
- d. Operator's Manual, Army Model CH-47B and CH-47C Helicopters, TM55-1520-227-10.
- 2. The performance data presented to TRASANA is the result of combining the helicopter power required, engine power available and engine fuel flow characteristics. The CH-47C power required was calculated from a non-dimensional representation of engine power required (coefficient of power) v.s. gross weight (coefficient of thrust) and true airspeed (advance ratio). The non-dimensional power required was obtained from reference la and lc. All performance in ground effect represents a 10 foot skid height. A temperature dependent correction, based on the method outlined in reference lb, was made to the power required to account for compressibility which could not be accounted for in the non-dimensional representation.
- 3. The T55-L-11 engine power available to the CH-47C (which was used in combination with the power required to find helicopter take-off and speed limits) was used as a function of altitude and temperature, from reference 1c.
- 4. The engine fuel flow at a particular altitude and temperature combination was derived from a representative referred fuel flow as a function of referred engine power. The referred fuel flow curve for the T55-L-11 engine was taken from reference 1c. The calculated fuel flows reflect 5% conservatism. A referred parameter is one which is divided by temperature and pressure ratios in order to represent all atmospheric conditions by one function.
- 5. The never exceed speeds (Vn.e.) were calculated from those shown graphically in reference 1d.
- 6. The Structu. al Gross Weight limit of the CH-47C is 46000 lbs.

JAMES A. O'MALLEY TII Struc & Aeromech Br